



**US Army Corps  
of Engineers®**  
Wilmington District

# **FINDING OF NO SIGNIFICANT IMPACT**

**PRECONSTRUCTION MODIFICATIONS  
OF  
AUTHORIZED IMPROVEMENTS**

**WILMINGTON HARBOR  
NORTH CAROLINA**

**August 2000**

**FINDING OF NO SIGNIFICANT IMPACT**

**PRECONSTRUCTION MODIFICATIONS OF  
AUTHORIZED IMPROVEMENTS  
WILMINGTON HARBOR, NORTH CAROLINA**

**August 2000**

**Table of Contents**

<b><u>Subject</u></b>	<b><u>Page No.</u></b>
1.00 PROPOSED PROJECT .....	1
2.00 PURPOSE AND NEED .....	3
3.00 PUBLIC AND AGENCY COORDINATION .....	4
4.00 RESPONSES TO COMMENTS ON THE EA AND RESOLUTION OF ISSUES.....	5
5.00 FEDERAL AGENCIES .....	6
5.01 US Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, letter dated March 15, 2000 .....	6
5.02 US Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, second letter dated March 15, 2000 .....	15
5.03 US Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, letter dated March 13, 2000 .....	18
5.04 US Environmental Protection Agency, Region IV, letter dated March 22, 2000 .....	21
5.05 US Department of the Interior, Fish and Wildlife Service, letter dated March 30, 2000.....	25
5.06 US Department of the Interior, Supplement to the Final Fish and Wildlife Coordination Act Report, April 2000 .....	43
6.00 STATE AGENCIES .....	51
6.01 North Carolina Ports, letter dated March 6, 2000 .....	51
6.02 NC Department of Environment and Natural Resources, letter dated March 30, 2000 .....	52
6.03 NC Division of Coastal Management, letter dated March 30, 2000 .....	52
6.04 NC Department of Cultural Resources, letter dated March 3, 2000 .....	53
6.05 NC Division of Water Quality, letter dated March 13, 2000 .....	53
6.06 NC Division of Water Quality, letter dated March 17, 2000 .....	54

**FINDING OF NO SIGNIFICANT IMPACT**

**PRECONSTRUCTION MODIFICATIONS OF  
AUTHORIZED IMPROVEMENTS  
WILMINGTON HARBOR, NORTH CAROLINA**

**August 2000**

**Table of Contents – cont'd**

<b><u>Subject</u></b>	<b><u>Page No.</u></b>
6.07 NC Department of Environment and Natural Resources, letter dated March 13, 2000 .....	55
6.08 NC Department of Commerce, letter dated March 16, 2000.....	55
6.09 NC Wildlife Resources Commission, letter dated March 29, 2000 .....	55
6.10 NC Wildlife Resources Commission, letter dated March 31, 2000 .....	65
6.11 NC Division of Marine Fisheries, letter dated March 30, 2000.....	65
 7.00 LOCAL AGENCIES .....	 66
7.01 Brunswick Beaches Consortium, letter date March 29, 2000 .....	66
 8.00 ELECTED OFFICIALS .....	 67
8.01 New Hanover County Board of Commissioners, letter dated March 10, 2000 .....	67
8.02 Representative Daniel F. McComas, letter dated March 13, 2000 .....	67
8.03 Mayor Harry Simmons, Town of Caswell Beach, letter dated March 28, 2000.....	68
8.04 Mayor Joan L. Altman, Town of Oak Island, letter dated March 23, 2000.....	69
 9.00 CONSERVATION GROUPS .....	 70
9.01 National Audubon Society, letter dated March 16, 2000 .....	70
 10.00 INTERESTED BUSINESSES, GROUPS, AND INDIVIDUALS.....	 72
10.01 Burlington Industries, Inc., letter dated March 8, 2000 .....	72
10.02 H. Spalding Craft, letter dated March 9, 2000 .....	72
10.03 Star Shipping Inc., letter dated March 9, 2000 .....	73
10.04 Solar International Shipping Agency, Inc., General Agent for Yang Ming Line, letter dated March 10, 2000 .....	73
10.05 Andrew Koepfel, letter dated March 10, 2000.....	74
10.06 OxyChem, letter dated March 30, 2000 .....	74
10.07 Morehead City Terminals, Inc., letter dated March 14, 2000 .....	75

**FINDING OF NO SIGNIFICANT IMPACT**  
**PRECONSTRUCTION MODIFICATIONS OF**  
**AUTHORIZED IMPROVEMENTS**  
**WILMINGTON HARBOR, NORTH CAROLINA**

**August 2000**

**Table of Contents – cont'd**

<b><u>Subject</u></b>	<b><u>Page No.</u></b>
10.08 Hanjin Shipping Company Ltd., letter dated March 15, 2000.....	76
10.09 North Carolina Citizens for Business and Industry, letter dated March 17, 2000 .....	76
10.10 Frank S. Colon, letter dated March 15, 2000 .....	77
10.11 Laela S. Sayigh, letter dated March 20, 2000 .....	77
10.12 Brooks, Pierce, McLendon, Humphrey&Leonard, L.L.P, firm representing Village of Bald Head Island, letter dated March 31, 2000 .....	78
11.00 ENVIRONMENTAL COMMITMENTS.....	84
12.00 FINDING OF NO SIGNIFICANT IMPACT .....	88

**List of Attachments**

ATTACHMENT 1. Letters Received During the Comment Period .....	89
--	----

**FINDING OF NO SIGNIFICANT IMPACT**  
**PRECONSTRUCTION MODIFICATIONS OF**  
**AUTHORIZED IMPROVEMENTS**  
**WILMINGTON HARBOR, NORTH CAROLINA**

**August 2000**

**1.00 PROPOSED PROJECT:** Wilmington Harbor, located on North Carolina's southeast coast, is one of the State's two deep-water ports and a major contributor to its economy. This Federal project connects deep water of the Atlantic Ocean with port facilities at Wilmington by way of a 37-mile-long channel along the Cape Fear and Northeast Cape Fear Rivers. Congressionally authorized harbor improvements scheduled to begin work in September 2000 include deepening the navigation channel generally by 4 feet, extending the existing channel seaward approximately 3.5 miles, and widening specific portions of the project. The previously approved plans were described in detail in the June 1996 Final Feasibility Report and Environmental Impact Statement (EIS) on Improvement of Navigation, Cape Fear - Northeast Cape Fear Rivers Comprehensive Study, Wilmington, North Carolina, Volumes I, II, and III, and were prepared by the U.S. Army **Corps** of Engineers, Wilmington District, (**Corps**). These plans have undergone recent modifications and refinements which are described in detail in the February 2000 Environmental Assessment (EA), Preconstruction Modifications of Authorized Improvements, Wilmington Harbor North Carolina, and were also prepared by the **Corps**. The proposed modifications are summarized below. Following each modification is a summary of the written comments received during the EA comment period and the **Corps** responses to the comments. Monitoring is proposed for limited aspects of the project where some uncertainty exists regarding project impacts. However, the results of this monitoring are not anticipated to alter the **Corps** of Engineers' position that the proposed modifications will not significantly affect the quality of the human environment.

1. Establishment and maintenance of a harbor entrance channel through the ocean bar on a new alignment. This new alignment would reduce deepening costs and potential environmental impacts associated with rock blasting along the existing channel alignment and would avoid excavating live coral bottom present in the existing channel.

**Comment:** All comments related to this modification basically agreed that this was the best alternative.

2. Year-round placement of about 5.6 million cubic yards of beach-compatible sand from the new channel alignment and lower harbor channels on nearby beaches in Brunswick County.

**Comment:** This modification generated the most comments. The concerns included impacts on beach and surf zone habitat used by sea turtles, sea beach amaranth, shorebirds, invertebrates, larval fish and essential fish habitat (EFH) in the surf zone.

**Response:** Much of the beach is highly eroded and provides only margin habitat for the resources using the beach. Beach disposal will restore much of this habitat. However, there are some

uncertainties concerning beach disposal impacts on the beach and surf zone resources. The **Corps** will address these issues through the development of an integrated monitoring plan. This plan will be developed through coordination with all interested agencies or individuals, and it should be implemented by the fall of 2000. See paragraph 11.00 of this FONSI regarding monitoring and other environmental commitments.

Critical wintering habitat for piping plover has been proposed by the US Fish and Wildlife Service under the Endangered Species Act (ESA) for several North Carolina Beaches. If beach disposal is planned in any of these areas, the disposal will either be eliminated or approval for disposal will be sought under the ESA.

3. Placement of about 1.9 million cubic yards of beach-compatible sand dredged from navigation channels and disposal islands of the lower Cape Fear River, for maintenance of beaches at existing authorized Federal shore protection projects of lower New Hanover County. A part of this sand may also support beach erosion control activities at the Fort Fisher Revetment project, and/or to supply sand to beaches of Brunswick County.

**Comment:** Comments on this modification were similar to those expressed for modification 2 above, except concerns were expressed about the potential impacts of disposal on the coquina outcrops in the Fort Fisher vicinity.

**Response:** See response to modification 2 regarding Brunswick County beaches. All potential disposal areas in New Hanover County have received the required environmental clearances under previous environmental documents. Regarding coquina outcrops and EFH, downdrift sedimentation from beach disposal and turbidity may increase over the short term and may cause slight increases in the rate at which the coquina rock outcrops are periodically covered by sediment. Post-nourishment conditions in the downdrift littoral zone are expected to be similar to the natural conditions of the past. It is not expected that the coquina rock outcrops or their biological communities will experience any major changes or significant impacts as compared to natural conditions.

4. Backfilling to restore the abandoned portion of the old ocean bar channel with material unsuitable for beach or littoral zone placement.

**Comment:** Loss of benthic habitat with the creation of a new channel should be mitigated in-kind with backfilling the abandoned channel with identical or very similar substrate grain size, composition and geomorphology as adjacent benthic substrates and the backfilled channel should be monitored with bathymetric and benthic surveys.

**Response.** It would be impossible to reestablish substrate characteristics along the backfilled channel that are identical to those of the surrounding area, given the practical constraints associated with contract dredging operations and the existing variable grain size distribution of sediments to be derived from harbor deepening. Planned backfilling of the channel would maximize the utilization of sediment that has high sand content but that does not meet the required 90% minimum for beach placement. Bathymetric surveys will be conducted at least annually along the abandoned channel in order to document the progress and ultimate completion of the backfilling activity. Surveys of benthic organisms are not proposed since the backfilled channel will repopulate with benthos from surrounding areas. Any changes in benthic community structure would not necessarily translate into specific impacts through the food chain.

5. Placement in the ODMDS of all dredged sediment that does not go to the beaches, the littoral zone, disposal islands, or abandoned channel.

**Comment:** All comments related to this modification basically agreed that this was the best alternative.

6. Utilization of blast pressure criteria rather than air curtains as a protective measure to minimize impacts on aquatic resources during blasting for rock removal in the river.

**Comment:** Most of the comments related to this modification basically agreed that this was the best alternative. However, concerns were expressed about the uncertainty of the impacts of blasting on larval fish and the number of adult fish that may be killed.

**Response:** Blasting will only occur during the imposed NC Marine Fisheries window of August – January. However, due to the uncertainties of the potential impacts of the proposed blasting plan on larval fishes, some additional monitoring is justified and will be developed through coordination with all interested agencies or individuals. Significant numbers of adult fish should not be impacted since surveillance for schools of fish will be conducted by vessels with sonar fish finders for a period of 20 minutes before each blast, and if fish schools are detected, blasting will be delayed until they leave. The surveillance zone will be approximately circular with a radius of about 500 feet extending outward from each blast set. In addition, the channel net set downstream of each blast should provide an estimate of what is killed or injured and remains near the bottom.

The **Corps** and the Wilmington Harbor project sponsor, the State of North Carolina, have agreed to construct a fish passage structure at Lock and Dam No. 1 on the Cape Fear River. This is the most downstream structure blocking fish passage on the river, and successful passage of fish over Lock and Dam No. 1 will open up about 32 miles of the main stem of the Cape Fear River to anadromous and other fishes. Additional investigations are required to determine the final design, but construction will probably consist of a rock rubble structure or similar feature.

7. Establishment of a clear, comprehensive plan for utilization of all types of dredging equipment and disposal alternatives that are appropriate for use in each specific portion of the harbor, insofar as their use is consistent with protection of the environment.

**Comment:** Concerns expressed were related to dredging outside the seasonal dredging windows (August 1 through January 31) in the lower harbor and that a study indicated potential disruption of American shad movement by the presence of dredging equipment.

**Response:** Environmental clearances have been previously obtained for year-round work in most of the areas in the lower harbor, no primary nursery areas are nearby, and all the year-round dredging proposed in the lower harbor is in sandy areas where turbidity will be minimal. In addition, the study that discussed disruption of upstream movement of shad was in a narrow section of the harbor and still most of the shad moved up the main ship channel past the dredging operation. The location in the harbor of concern to the commentors is much wider than the study area; therefore, the shad would be more likely to move unimpeded upstream.

**2.00 PURPOSE AND NEED:** The project as described in the 1996 EIS would provide economic benefits by increasing navigation efficiency in the harbor while minimizing impacts on the environment. The proposed modifications described in the February 2000 EA are judged to provide additional economic and/or environmental benefits. Cost savings would include about \$40 million for the new entrance channel

and about \$20 million for elimination of the air curtains. Environmentally the new ocean bar channel would avoid live coral bottom. The air curtains are eliminated because they did not provide the environmental protection anticipated, and environmental impacts in their absence are anticipated to be minor.

**3.00 PUBLIC AND AGENCY COORDINATION:** On February 7, 2000, the EA referenced above was mailed to Federal and State agencies and the interested public for a 30-day review and comment period. Based on a request from the North Carolina Clearinghouse and others, the response date was extended about 2 weeks until April 3, 2000. Everyone providing comments on the EA will be mailed a copy of the Finding of No Significant Impact (FONSI). A notice of availability of FONSI will be mailed to others on the project mailing list. Comments on the EA were received from the following:

**Federal Agencies**

- US Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service
- US Environmental Protection Agency, Region IV
- US Department of the Interior, Fish and Wildlife Service

**State Agencies**

- North Carolina Ports
- NC Department of Environment and Natural Resources
- NC Division of Coastal Management
- NC Department of Cultural Resources
- NC Division of Water Quality
- NC Department of Commerce
- NC Wildlife Resources Commission
- NC Division of Marine Fisheries

**Local Agencies**

- Brunswick Beaches Consortium

**Elected Officials**

- New Hanover County Board of Commissioners
- Representative Daniel F. McComas
- Mayor Harry Simmons, Town of Caswell Beach
- Mayor Joan L. Altman, Town of Oak Island

**Conservation Groups**

- National Audubon Society

**Interested Businesses, Groups, and Individuals**

- Burlington Industries, Inc.
- H. Spalding Craft
- Star Shipping, Inc.
- Solar International Shipping Agency, Inc., General Agent for Yang Ming Line
- Andrew Koeppel



- OxyChem
- Morehead City Terminals, Inc.
- Hanjin Shipping Company, Ltd.
- North Carolina Citizens for Business and Industry
- Frank S. Conlon
- Laela S. Sayigh
- Brooks, Pierce, McLendon, Humphrey & Leonard, L.L.P, firm representing Village of Bald Head Island

In addition, all the required environmental clearances or coordination documents have been received for the proposed action. They were received after April 3, 2000, the end of the EA comment period, and are as follows:

- Water Quality Certification No. 3085 issued October 17, 1996, was modified by letter dated April 10, 2000 to cover the proposed action.
- Supplement to the Final Fish and Wildlife Coordination Act Report, Wilmington Harbor, North Carolina, 96 Act, New Hanover and Brunswick Counties, North Carolina, April 2000, transmitted by letter dated April 28, 2000. Responses to recommendations are indicated in Paragraph 5.06 above.
- US Fish and Wildlife Service Biological Opinion for the Proposed Preconstruction Modifications of Authorized Improvements, Wilmington Harbor, North Carolina, May 3, 2000. We will comply with the incidental take statement, associated reasonable and prudent measures, and terms and conditions implementing them.
- Environmental Protection Agency letter of May 1, 2000, indicating concurrence with our Tier 1 evaluation under the Ocean Dumping Act that the new work and maintenance dredged material is acceptable for ocean disposal in the Wilmington ODMDS.
- National Marine Fisheries Service Biological Opinion for the Proposed Preconstruction Modifications of Authorized Improvements, Wilmington Harbor, North Carolina, August 3, 2000. We will comply with the incidental take statement, associated reasonable and prudent measures, and terms and conditions implementing them.
- NC Division of Coastal Management letter of June 15, 2000, providing a statement of concurrence that the proposed action is consistent with the NC Coastal Management Program. We will comply with the conditions indicated in the letter.

**4.00 RESPONSES TO COMMENTS ON THE EA AND RESOLUTION OF ISSUES:** All comments received on the EA and other correspondence indicated above were considered in making the decision to sign a FONSI. Copies of the letters commenting on the EA are included in Attachment 1. Pertinent comments from each commentor are summarized and addressed below. All comments received on the EA have been resolved either through providing additional information in this FONSI or agreeing to develop appropriate monitoring as indicated in paragraph 11 of this FONSI. As indicated in paragraph 1.00 above, monitoring is proposed for limited aspects of the project where some uncertainty exists regarding project impacts. However, the results of this monitoring are not anticipated to alter the **Corps** position that the proposed modifications will not significantly affect the quality of the human environment.

## 5.00 FEDERAL AGENCIES:

### **5.01 US Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS), letter dated March 15, 2000**

**NMFS Comment 1** (last paragraph on page 1 and first paragraph on page 2): The EA does not adequately address project-related impacts to NMFS trust fishery resources and essential fish habitat (EFH) for federally managed species. The sections of the document that address EFH do not include the surf zone as an impacted category of EFH. The South Atlantic Fishery Management Council has identified the surf zone as EFH for white shrimp, black sea bass, cobia, lane snapper, red drum, and Spanish mackerel. The EA also does not adequately address the impacts to the various life history stages of other estuarine-dependent fishery resources found in the surf zone and nearshore waters. The discharge of dredged material in these areas could adversely impact early life stages of species that accumulate along the beach front prior to their movement into the Cape Fear River to reach upstream primary nursery areas (PNA).

The potential impacts of this project on fishery resources is exacerbated by the multitude of private and Federal projects proposing beach nourishment or nearshore disposal of dredged material, hurricane protection, or the beneficial use of dredged material generated by maintenance of Federal navigation projects. However, insufficient information is available to adequately address the impacts of beach nourishment on various life stages of fishery resources that utilize the surf zone as habitat. Accordingly, the EA should be revised to more completely address the limits of our understanding of the impacts to fishery resources associated with the discharge of dredged material on or just offshore of ocean beaches. The EA should also include a plan to monitor impacts to early life stages of fish in the surf zone. Without a better understanding of this issue, adverse impacts to EFH could be underestimated for this and future projects involving beach nourishment.

**Corps Response:** NMFS considers the surf zone to be a subcategory of the EFH water column (personal communication, Ron Sechler, NMFS, Beaufort, NC). The surf zone is very important in the context of fishery resources (discussed in the EA on page 20) and typically has a diverse fish fauna. Fifty-two fish species have been reported from North Carolina beaches (Ross, 1996; Ross and Lancaster, 1996). Menhaden, anchovies, silversides, and mullets are often present in large, dense schools, and many larger species are also seasonally common in the surf zone. Of fish species dominant there, the Florida pompano and the Gulf kingfish use it almost exclusively as a nursery area and juveniles are seldom found elsewhere. The major recruitment period for juvenile fishes to surf zone nurseries is late spring through early summer. Nearshore and surf zone waters may also provide important fish migration routes. Adult fishes apparently migrate very close to the beach in fall and larvae/juveniles use these areas in the winter and spring (Hackney et al., 1996).

Scientific data are very limited with regard to the effects of beach disposal on fishery resources. These effects may be similar, on a smaller scale, to the effects of storms; storm effects may include increased turbidity and sediment load in the water column and, in some cases, changes in fish community structure (Hackney et al., 1996). Storms of great severity, such as hurricanes, have been documented to create conditions resulting in fish kills, but such situations are not usually associated with beach disposal of dredged sand. The EA discusses the environmental impacts of beach disposal on page 34 in terms of the

intertidal invertebrate community and on page 37 in terms of the water column. In addition, beach disposal of dredged sediments can affect fishery resources and EFH through increases in turbidity and sedimentation which, in turn, may create localized stressful habitat conditions and may result in temporary displacement of fish and other biota. However, the sediment proposed for beach placement by the Wilmington Harbor project would average 90% or more sand. Because of the low silt/clay content, water column impacts are, therefore, expected to be localized, short-term, and minor. Furthermore, the beach disposal operation is expected to proceed at a rate of only about 200 feet per day and about 1 mile per month. Mobile biota, including juvenile and adult fish, should be able to relocate outside the more stressful conditions of the immediate disposal operation. Cumulative effects of multiple, simultaneous beach disposal operations could, in theory, be potentially harmful to fishes of the surf zone; however, the high quality of the sediment selected for beachfill and the small amount of beach affected at any point in time would not suggest that this activity poses a significant threat. Nevertheless, the unknowns concerning the occurrence, distribution, and life history aspects of surf zone fishes and their sensitivity to beach disposal impacts suggest that further study is warranted. The **CORPS** will address this concern through the development of an integrated monitoring plan aimed at identification and quantification of beach disposal impacts on sea turtles, larval and juvenile fishes, shorebirds, and surf zone invertebrates. It is anticipated that this plan will be developed through coordination with all interested agencies or individuals and that it will be implemented in the fall of 2000. See paragraph 11.00 of this FONSI regarding monitoring and other environmental commitments.

**NMFS Comment 2** (second paragraph on page 2): NMFS also is concerned that the EA inadequately addresses the impacts on larval fish of blasting for rock removal in the upper Cape Fear River. We have previously identified this as an important category of impact for which limited data are available. Air bubble curtains were proposed in the original plans to ameliorate the impacts of blasting on fishery resources. However, the study of the bubble curtains (Appendix B) concluded that they were ineffective in reducing mortality in the early life stage of selected fishes. As a result, their use is removed from the modified project plans resulting in a savings of about \$20 million. We concur with the COE's decision not to use bubble curtains. However, the EA should be revised to address the impacts of blasting on larval fish more thoroughly and provide a basis for the determination that this impact is not expected to be significant.

Seasonal restriction on blasting and blast pressure limits are incorporated into the project to mitigate the impacts of blasting. However, larvae and juveniles of federally managed species such as red drum are present in the estuarine water column during the period when blasting is allowed. Furthermore, blasting will occur close to the PNAs that are located in the upper reaches of the Cape Fear River. Because the effectiveness of controlling blast pressures to reduce impact to larvae is untested, there is no way to ascertain that this measure will avoid or minimize impacts to fish. We recommend that the EA be revised to include a monitoring and research plan to improve the understanding of the magnitude and scope of impacts on larval fish and to evaluate the effectiveness of the COE's strategy to use blast pressure controls as a protective measure.

**Corps Response:** The **Corps** will address this concern through the development of an integrated monitoring plan aimed at identification and quantification of blasting impacts on larval fishes. It is anticipated that this plan will be developed through coordination with all interested agencies or individuals

and that it will be implemented in the fall of 2000. See paragraph 11.00 of this FONSI regarding monitoring and other environmental commitments.

**NMFS Comment 3** (first paragraph on page 3): The EA provides a comprehensive plan for utilization of all approved types of dredging equipment and dredged material disposal alternatives. The goal is to improve efficiency and flexibility in dredging and disposal of dredged material to reduce project cost. One aspect of the plan is to eliminate the seasonal restriction on dredging in the Ocean Bar II Contract (OBIIIC) area. We cannot support this proposal unless a more geographically and seasonally limited restriction is imposed. Specifically, the EA should be revised to address an alternative seasonal restriction that would prohibit dredging in January, February, and March for the Smith Island reach of the OBIIIC area. Avoiding dredging in this portion of the OBIIIC area during the late winter and early spring would avoid potential impacts to larvae of estuarine-dependent species and adult anadromous fish that are migrating into the river during this period.

**Corps Response:** As indicated on table 4 of the EA, we have received concurrence via several NEPA documents to dredge year-round in the lower river from Battery Island Channel offshore through Bald Head Shoal Channel (including Smith Island Channel). We are not aware of any new information that would necessitate the modification of these clearances. A study by Dr. Mary Moser Distribution and Movements of Shortnose Sturgeon (*Acipenser brevirostrum*) and Other Anadromous Fisheries of the Lower Cape Fear River, North Carolina, May 1993, looked at the movement of shad past dredging equipment. Shad moving upstream past the Wilmington area either remained in the main ship channel or used the Brunswick River. During the tagging study, a hydraulic pipeline dredge was operating in the ship channel between the mouth of the Brunswick River and the State Port. Of the tagged shad that went past the mouth of the Brunswick River and approached the dredge, less than half of them reversed course apparently to avoid the dredging operation and then proceeded up the Brunswick River. Most of the shad moving up the main ship channel past the dredging operation continued upstream. The harbor conditions in the river where the dredge was operating are considerably different from the river at Smith Island Channel. The river where the dredge was operating is less than 1,500 feet wide while in the Smith Island Channel the river is over 1 mile wide. Based on this information it is not likely that shad would be precluded from moving upstream past a dredge operating in Smith Island Channel.

In addition, larvae should not be significantly affected by a dredge operating in Smith Island Channel in January-March. Dredging would be in deep water because that is where the channel is. The memorandum of March 13, 2000, from Lawrence Settle to Larry Hardy of your agency indicates that studies conducted at Oregon Inlet, Ocracoke Inlet, and Beaufort Inlet have found that larvae are not equally distributed around the inlet delta or in the pass. Larvae tend to be more abundant on the upcurrent approach to inlets indicating that most are poised to enter the inlet from a lateral longshore direction and **not via the main navigation channel**. Within the inlet throat, we have found that **larvae are considerably more abundant along the inlet edge than in mid-channel (bold added for emphasis)**. Therefore, dredging on the bottom in mid channel should not cause an increased risk to larvae.

**NMFS Comment 4** (second paragraph on page 3): Page 5, paragraph 1 of the EA. The Fish and Wildlife Service indicates that there is a high mud content throughout most of the offshore project area and in the two disposal islands proposed for pump out to New Hanover County beaches. There were no core samples taken between stations 0+00 and 120+00 of Bald Head Shoal Channel, the section where

sediments will be used for beach disposal. While other data suggests that this material will be beach compatible, the EA contains no supporting data. The EA assumes that all of the sediment from this reach will be beach suitable, while currently available data suggest that might not be the case. Furthermore, there were no samples taken seaward of station 190+00 to document whether sediments from this point seaward are beach suitable materials. This includes the section of the new channel that runs through the ODMDS where beach suitable material has been dumped in the past. The EA should be revised to address these issues. Site specific information regarding the sediment grain size and availability of acceptable disposal alternatives must be identified for all portions of the project.

**Corps Response:** The results of additional core samples have been obtained since the publication of the EA. These samples were from areas around the inlet where data was lacking. Based on these and existing samples, we have determined that approximately 5.6 million cubic yards of beach quality sand is available for placement on the Brunswick County beaches. Several samples were taken adjacent to the proposed channel seaward of station 190+00. This information, along with the data between stations 190+00 and 170+00, indicated that there is no appreciable amount of beach quality sand in that area. Most of the dredged material deposited in the ODMDS had a high silt content and thus would be unacceptable for beach disposal, and we have no sediment samples indicating the presence of significant quantities of sand in the ODMDS.

**NMFS Comment 5** (third paragraph on page 3): Page 8, paragraph 6 of the EA. A number of measures designed to reduce the impact of blasting on aquatic resources are addressed in this section. However, the magnitude of impacts to larval fish during the period when blasting is allowed, remains unresolved. We recommend further consideration of directed research to quantify the scope and magnitude of impacts and provide an evaluation of the effectiveness of the plan to impose blast pressure limits to mitigate impacts.

**Corps Response:** See response to comment 2 above.

**NMFS Comment 6** (first paragraph on page 4): Page 16, paragraph 3 of the EA. The spatial extent of the beach disposal activities for the New Hanover and Brunswick County beaches is not provided in the EA. The exact quantity of beach quality dredged material has not been determined and negotiations are ongoing regarding economic, programmatic, and environmental priorities for beach nourishment. We understand that additional information will be provided when the results of ongoing sediment analyses become available and coordination with the State and local governments representing area beaches is completed. We recommend that the EA be revised to include a commitment to provide a supplemental document that addresses in detail the exact location of sand sources, beach disposal sites, and the proposed schedule for disposal for both the construction phase and maintenance of the project. This information will provide missing detail on the area and magnitude of impact.

**Corps Response:** As indicated on table 2 of the EA, about 1.9 million cubic yards of sand from the Wilmington Harbor project is available to New Hanover County beach communities and would be specifically for the purpose of beach renourishment within the previously coordinated and approved geographic limits of each respective project. These project lengths are 14,000 feet for Wrightsville Beach; 14,000 feet for Carolina Beach; and 18,000 feet for Carolina Beach, Area South (also known as Kure Beach). The State's Fort Fisher Revetment project has a requirement imposed by the NC Coastal

Management Program that erosional losses of sand be monitored for 7,000 feet of beach downdrift (south) of the rock revetment and 1,000 feet updrift (north). If erosional losses exceed an established threshold over a 2-year confirmation period, such losses are to be mitigated by sand placement. Monitoring data through April 1999 show that about 4,500 feet of the downdrift beach may be subject to this requirement in the near-term future.

As indicated in response 4 above, about 5.6 million cubic yards of sand from the Wilmington Harbor project is available for disposal on Brunswick County beaches. Its distribution will depend on the outcome of pending decisions (at the Washington, DC level) regarding approval for Federal cost sharing under the authority of Section 933 of the Water Resources Development Act of 1986 (discussed on page 5 of the EA). Potential dimensions are indicated on pages 6 and 7 of the EA. Subsequently, the plans and specifications that are prepared for the dredging/disposal contract will show the locations of beach quality sand sources in the channels and the beach limits available for sand placement. The contract will not require that sand from specific areas go to certain destinations, but these quantities can be correlated after the work is completed when data are compiled. Such data are not published as official reports but would be available to the public upon request. In the past, expressions of public interest in such data have not been sufficient to justify the publication of special reports.

Scheduled start dates for contract work on Wilmington Harbor appear in the EA on page 14. Within each contract, the order of work may or may not be specified, depending upon factors relevant at that time, so specific dates for specific portions of the work will not be known in advance. However, once the work is ongoing, interested parties may inquire regarding the location of ongoing work and potential target dates for completion.

Impacts of the proposed action were described in the EA in terms of their potential greatest magnitude. Final details on sediment quantities and placement sites would not increase the magnitude of impacts, as described, so further description is not required.

**NMFS Comment 7** (second paragraph on page 4): Page 20, paragraph 2 of the EA. The surf zone is described in this section as providing important fish habitat. However, the description does not identify it as EFH for federally managed species. This section should be expanded to address the full list of species and their life stages that are found throughout the year in the surf zone or just offshore. A complete characterization of fishery resources in the surf zone is important because this is the aquatic habitat most directly effected by beach nourishment.

**Corps Response:** Descriptive information on EFH and fish species dependent on this habitat is provided in the EA on page 22 and in Tables 5 and 6. These pages indicate that at least one of the four life stages (eggs, larvae, juveniles, and adults) of 77 EFH fish species occur in the Atlantic Ocean south of Cape Hatteras. A number of these, as well as numerous forage species, comprise the 52 species identified from the North Carolina surf zone, as noted on page 20 of the EA and listed in the referenced publications (Ross, 1996; Ross and Lancaster, 1996). The **Corps** response to NMFS Comment 1 above provides additional information on the surf zone as EFH, as well as an integrated monitoring plan aimed at identification and quantification of beach disposal impacts on sea turtles, larval and juvenile fishes, shorebirds, and surf zone invertebrates. It is anticipated that this plan will be developed through



coordination with all interested agencies or individuals and implemented in the fall of 2000. See paragraph 11.00 of this FONSI regarding monitoring and other environmental commitments.

**NMFS Comment 8** (third paragraph on page 4) : Page 27, paragraph 6 of the EA. This section should acknowledge that alterations of the physical environment in the surf zone may adversely impact fishery resources.

**Corps Response:** This section of the EA addresses environmental impacts on Geology and Sediments, i.e., in a physical context. As is noted in the subsequent paragraph (page 28, paragraph 1 of the EA), "The overall physical impacts of sand placement on beaches are insignificant in a geological context. Biological impacts are discussed in the sections of this report dealing with living organisms." In the context of living resources, the following information is provided to expand and clarify page 34 of the EA at Impacts on Intertidal Macrofauna and page 37 of the EA at Impacts on the Marine and Estuarine Water Column. Biota of the surf zone are subject to the effects of stressful conditions generated by any changes in their immediate environment, either physical, chemical, or biological. All three types of changes may result from beach disposal activities. Physical covering of the substrate may bury some organisms so deeply that they are unable to escape or to obtain sufficient life-sustaining oxygen. Changes in grain-size or other physical or chemical sediment characteristics may alter the suitability of the substrate for habitation by some species of invertebrates. Mole crabs, coquina clams, and various species of amphipods and polychaete worms are likely to experience some level of adverse effects. Changes in the invertebrate community structure may alter the amount and quality of food sources for surf-feeding fish and shorebirds and result in their temporary displacement to other areas.

Because of these effects, beach disposal can be expected to bring about short-term changes in the surf zone community. These changes are not persistent, however, and recovery begins soon after the disposal operation ceases or moves on. Water quality effects tend to dissipate within a few days, while full recovery of the biological community may require a period of months, and up to a year or two, depending upon the timing of beach disposal relative to the life cycles of affected organisms.

**NMFS Comment 9** (fourth paragraph on page 4): Page 28, paragraph 5 of the EA. Kure Beach's coquina outcrops are not listed in the hardbottoms discussion and neither are hardbottoms off Oak Island. Both these areas are EFH and within the "active littoral zone." The COE claims on page 28 that all hardbottoms are seaward of the littoral zone is incorrect and should be revised. The discussion of impacts to hardbottoms also does not address turbidity as a potential source of impact from dredging of the new channel, backfilling the old channel, transporting overfilled barges, scows, and hoppers to and from the beach, and the washing of fine sediments off the beach onto nearshore hardbottoms. The EA, therefore, should be revised to address these potential impacts to hardbottoms, which are designated as EFH.

**Corps Response:** Hardbottoms of the project vicinity are described on page 22, paragraph 3 of the EA, where it is noted that substantial amounts of low-relief hardbottoms occur off Brunswick County, generally more than one mile offshore. Recent bottom surveys show the presence of hardbottoms between Lockwoods Folly Inlet and the western limits of Jay Bird Shoal, including the area off Oak Island (Cleary, 1999). Rock comprising these hardbottoms is periodically exposed as the thin veneer of sediments in this area is reworked by storms and other natural processes. The amounts and locations of

exposed hardbottom off Brunswick County are continually changing as sediments are redistributed, alternately covering and uncovering the underlying low-relief rock.

The **Corps** use of the term "littoral zone" in the context of coastal engineering is the nearshore zone where significant longshore transport of sand occurs in response to wave action. The performance of beachfill placement is evaluated on the basis of conditions in this zone. This zone along Brunswick County beaches extends seaward from the shoreline to about the 20-foot depth contour. Hardbottoms off Brunswick County are generally seaward of the 30-foot depth contour.

Hardbottoms are also present along the southern coast of New Hanover County and include three onshore coquina outcrops located in the littoral zone near the Fort Fisher Museum, as well as numerous scattered submerged exposures to the south. The Fort Fisher outcrops, exposed as a result of shoreline erosion since 1865, are the only known natural marine rock outcroppings along the entire North Carolina beach system. These rocks provide valuable habitat for various species of marine algae, molluscs, sea stars and sea urchins, and crabs, as well as other forms of marine life. Numerous fish species utilize these areas, and shorebirds often forage on the exposed outcrops at low tide. In 1982, the Fort Fisher Coquina Outcrop Natural Area, consisting of 27 acres, was registered as a North Carolina Natural Heritage Area, which established an intention to maintain it in its natural condition for educational, scientific, recreational, and esthetic purposes.

The Fort Fisher coquina rock outcrops have historically trapped sand in a manner similar to low groins, and portions of them have been buried periodically only to reemerge later as they are exposed through the scouring action of natural processes. The initial construction of the Carolina Beach, Area South Shore Protection project in 1996 did not cover the coquina outcrop. The project displaced the ocean shoreline seaward about 100 feet, but shoreline erosion still occurs much as before. The sand moving in the littoral zone alternately covers and uncovers various portions of the coquina rock located to the south of this project. Future renourishment of the Carolina Beach, Area South project will restore the beach to its project design profile. The renourishment event can be expected to produce short-term, minor impacts in terms of increased turbidity and sedimentation in the surf zone, localized mortality of many organisms of the intertidal invertebrate community, and displacement of surf-feeding fish and shorebirds until ecological recovery occurs. Downdrift sedimentation and turbidity may increase over the short term and may cause slight increases in the rate at which the coquina rock outcrops are periodically covered by sediment. Post-nourishment conditions in the downdrift littoral zone are expected to be similar to the natural conditions of the past. It is not expected that the coquina rock outcrops or their biological communities will experience any major changes or significant impacts as compared to natural conditions.

Sand deposited on the eroding beach south of the Fort Fisher Revetment project would produce surf-zone impacts, similar to those described in the preceding paragraph, but should have no significant impact on the coquina rock outcrops, which are located updrift (north) of this project.

The numerous scattered submerged exposures of coquina rock off Fort Fisher could experience short-term changes in the rate of sedimentation. However, such changes are likely to be within the range of natural, historical changes in sedimentation rates and are not expected to produce any significant adverse impacts on these areas.



Localized, minor, short-term increases in turbidity could result from dredging of the new channel; backfilling the old channel; transporting overfilled barges, scows, and hoppers to the beach; and the washing of fine sediments off the beach. However, it is not expected that the magnitude or duration of these effects would have any significant impacts on hardbottoms, particularly since none are known to occur in the immediate vicinity of the proposed work.

**NMFS Comment 10** first paragraph on page 5): Page 32 paragraph 4 of the EA. We disagree with the conclusion that, "some mortality of fishes may occur close to each blast," but "the number affected is not expected to be large, and this impact is not expected to be significant." Insufficient data are available on the impacts of blasting on larval fish to reach this conclusion. In addition, there is no plan in the EA to evaluate the effectiveness of the blast pressure limits that the COE proposes to minimize impacts. Because Federally managed species such as red drum would be impacted the finding in this section of the EA should be re-evaluated.

**Corps Response:** See response to NMFS Comment 2 above.

**NMFS Comment 11** (second paragraph on page 5): Page 35 paragraph 2 of the EA. The surf zone is not included in the list of EFH habitat categories in this section and in Table 8. The surf zone should be added because it is the area most likely impacted by the proposed disposal of dredged material on up to 14.97 (sic) miles of beach. In addition, the evaluation of impacts should consider the full range of species and life stages of fishery resources that utilize this habitat.

**Corps Response:** While the surf zone was not specifically identified as EFH in tables 6 and 7 of Essential Fish Habitat, New Marine Fish Habitat Conservation Mandate for Federal Agencies (NMFS, 1999), the NMFS considers this a subcategory of the water column (personal communication, Ron Sechler, NMFS, Beaufort, NC). In this context, it should be included in Tables 6 and 8 of the EA. The surf zone coincides with the shore-water interface along North Carolina's entire 320-mile coast, and includes the intertidal zone that is populated with invertebrates, fishes, and shorebirds. The **Corps** response to NMFS Comment 1 above provides additional information on the surf zone as EFH, as well as an integrated monitoring plan aimed at identification and quantification of beach disposal impacts on sea turtles, larval and juvenile fishes, shorebirds, and surf zone invertebrates. Also, see paragraph 11.00 of this FONSI regarding monitoring and other environmental commitments.

**NMFS Comment 12** (third paragraph on page 5): Page 38, paragraph 3 of the EA. We disagree with the conclusion that the proposed action is not expected to cause adverse impacts to EFH. As noted above, beach disposal of dredged material and blasting for rock removal could impact the surf zone and the hardbottom categories of EHF and the Federally managed resources they support.

**Corps Response:** Blasting for rock removal is proposed only in the river beginning about river mile 18. Clearly, this is beyond the distance of potential blasting impacts on surf zone or hardbottom habitat in the ocean. The surf zone impacts of beach disposal are discussed in the **Corps** response to NMFS Comment 1 addressed in Paragraph 5.01 above.

**NMFS Comment 13** (fourth paragraph on page 5): Page 43, paragraph 3 of the EA. The extent to which this project will add to the cumulative impacts of the large number of projects involving beach-

altering activities along the North Carolina coast should be addressed. Furthermore, the discussion of cumulative impacts does not consider the Brunswick County Beaches Nourishment Project (scheduled for 2004-2005) which will occur only two to three years after beach disposal associated with the construction phase of this project is completed. NMFS does not agree that cumulative impacts to the beach strand ecosystem are short-term, minor, or negligible. The EA should be revised accordingly.

**Corps Response:** If all the existing and proposed beach disposal and beach nourishment projects in North Carolina were performed in one year, they would cover about 64.9 miles of the 320 miles (20.3%) of North Carolina shoreline. However, we would not receive funding to perform all these projects in any one year. The more likely or average scenario would be about 17.9 miles per year or about 5.6% of the coast. This would generally result in 3 to 4 years between disposal events on a particular stretch of beach. This disposal frequency should generally allow recovery of beach resources. Beach disposal does have environmental benefits such as restoring nesting habitat for sea turtles on highly eroded beaches. This is the case on most of the Brunswick County beaches where disposal is planned. In fact the major purpose of the Ecosystem Restoration Report, Section 1135, Sea Turtle Habitat Restoration, Long Beach North Carolina, (dated November 1998) project on Oak Island is restoration of turtle nesting habitat as is indicated by the title.

The proposed action will utilize sand removed from a navigation project in a beneficial manner that is consistent with the NC Coastal Management Program and the NC Administrative Code T15A:07M.1102. Dredged material removed from other Federal navigation projects during maintenance activities is increasingly utilized in a similar manner. These events are not for renourishment of authorized beach nourishment projects, but, instead, for replenishment of the State's beaches with sand which would, otherwise, be wasted. These actions are vital to the retention of sand resources within the active littoral system, and, although probably accompanied by some short-term ecological impacts, are considered to be in the overall public interest. It is important to keep these actions in perspective. Even though continuous disposal is proposed over an 18-month time period, it should be recognized that more than half of this time is scheduled for cold-weather months and the warm-weather disposal will be accompanied by specific measures for the protection of endangered and threatened species and nesting shorebirds. The continued placement of sand on Bald Head Island and Caswell Beach during maintenance dredging cycles will likewise, be scheduled for cold-weather months to the maximum extent practicable, and these events are expected to occur only every 2 years and on a site-rotational basis, as described in the EA on page 39. Overall, the impacts of these activities are considered insignificant, and their cumulative impact is also minor.

Pending plans for the possible construction of Federal Shore Protection projects on the beaches of Brunswick County may or may not proceed to implementation. If such plans become authorized projects, their impacts will be assessed in conjunction with other work accomplished prior to construction. It is inappropriate to project the outcome of such projects in the context of the Wilmington Harbor project.

**NMFS Comment 14** (fifth paragraph on page 5): The paucity of information on the impacts of beach nourishment and blasting on fishery resources, especially early life stages, warrants that directed monitoring and research would be beneficial in quantifying the magnitude and scope of project impacts. The enclosed memo from the CCFHR provides a brief overview of the types of studies that could address the impacts of beach nourishment and rock blasting on early life stages of fishery resources. If the above

concerns are not resolved, the NMFS cannot concur with a Finding of No Significant Impact for the project and in accordance with the National Environmental Policy Act implementing regulations from the Council on Environmental Quality, Section 1502.9(c)(1) must recommend that a supplemental Environmental Impact Statement be prepared.

**Corps Response:** The potential impacts of these action and proposed studies to address related data gaps are discussed in the **Corps** responses to NMFS Comments 1&2 addressed in Paragraph 5.01 above.

**NMFS Comment 15** (first paragraph on page 6): Based on our review of the EA and assessment of potential adverse impacts to fishery resources in general, federally-managed fishery resources, and EFH, the final project design should incorporate measures to ensure that impacts can be quantified and mitigated. Accordingly, NMFS recommends that mortality of early life stages of fishes associated with the blasting necessary for channel excavation should be quantified and any significant impacts should be mitigated. Further channel dredging in the Smith Island reach of the Ocean Bar II Contract should be scheduled to avoid work from January through March. This is a period of peak biological activity and when anadromous fishes migrate through the project area. The following recommendations also are provided pursuant to requirements of the Magnuson-Stevens Fishery Conservation and Management Act.

#### EFH CONSERVATION RECOMMENDATIONS

1. The project should be designed to avoid adverse impacts to surf zone habitats and associated fisheries. Otherwise, measures must be specified to offset the adverse impacts.
2. Measures necessary to compensate for unavoidable adverse impacts to EFH should be coordinated with the NMFS and incorporated as components of the overall project design and budget.

**Corps Response:** See the **Corps** responses to NMFS Comments 1, 2 and 3 addressed in Paragraph 5.01 above.

#### **5.02 U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS), second letter dated March 15, 2000 commenting on the EA.**

**NMFS Comment 1** (third paragraph on page 1 and first paragraph on page 2): Our review of the public notice and the EA, coordinated with the Center for Coastal Fisheries and Habitat Research (CCFHR), finds that NMFS trust resources, including essential fish habitat (EFH) designated by the South Atlantic (SAFMC) and Mid-Atlantic (MAFMC) Fishery Management Council, would be adversely impacted by various aspects of the proposal. The project is located in the Atlantic Ocean and the Cape Fear River which are identified as EFH for eggs, larvae, juvenile, and adult of red drum (*Sciaenops ocellatus*), bluefish (*Pomatomus saltatrix*), cobia (*Rachycentron canadum*), brown shrimp (*Penaeus aztecus*), pink shrimp (*Penaeus duorarum*), and white shrimp (*Penaeus setiferus*). In addition, EFH for larvae, juvenile, and adults of summer flounder (*Paralichthys lethostigma*) and black sea bass (*Centropristis striata*); juveniles of gag grouper (*Mycteroperca microlepis*) and gray snapper (*Lutjanus griseus*); and juveniles and adults of king mackerel (*Scomberomorus cavalla*), Spanish mackerel (*Scomberomorus maculatus*), and spiny

dogfish (*Squalus acanthias*) are located in the project area. Categories of EFH potentially impacted by this work include surf zone, marine and estuarine water columns, and mud and sand bottom habitat.

The project area also provides habitat for other commercially and recreationally important species including Atlantic croaker (*Micropogonias undulatus*), spot (*Leiostomus xanthurus*), spotted seatrout (*Cynoscion nebulosus*), Atlantic menhaden (*Brevoortia tyrannus*), and striped mullet (*Mugil cephalus*). These estuarine-dependent species serve as prey for other fisheries managed under the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) by the SAFMC (e.g., snapper grouper complex); the MAFMC (e.g., bluefish, summer flounder, spiny dogfish), and highly migratory marine species managed by the NMFS (e.g., billfish, tuna, and sharks). Detailed information on the above species and other Federally managed fisheries and their EFH is provided in the 1998 amendments of the Fishery Management Plans prepared by the SAFMC and the MAFMC and the highly migratory species amendments prepared by the NMFS. The amendments were prepared as required by the MSFCMA (P.L. 94-265). In addition, many of the above species have been identified in Section 906(e)(1) of the Water Resources Development Act of 1986 (PL 99-602) as species of "national economic importance."

**Corps Response:** The EA acknowledges the occurrence in the project area of one or more life stages of 77 federally-managed fish species (Table 5 of the EA), as well as commercially and recreationally important species (page 19 of the EA). The presence of EFH categories in the project area is also listed in the EA in Table 6, and potential impacts are described in Table 8 and pages 35 – 38. While we agree that some categories of EFH and some important fish species may experience project-related effects, available data suggest that any impacts would be localized, short-term, and minor.

**NMFS Comment 2** (second paragraph on page 2): We are concerned that continuous dredging for eighteen months and the discharge of a maximum of six million cubic yards of dredged material on the New Hanover and Brunswick County beaches would adversely impact fishery resources and EFH for Federally managed species. The surf zone is designated as EFH for white shrimp, black sea bass, cobia, lane snapper, red drum, and Spanish mackerel. Early life stages of other estuarine-dependent fishery resources found in the surf zone and nearshore waters are also at risk. The discharge of dredged material in these areas could adversely impact species that accumulate along the beachfront prior to their movement into the Cape Fear River to reach upstream primary nursery areas (PNA).

**Corps Response:** See the **CORPS** response to NMFS Comment 1 in Paragraph 5.01 above.

**NMFS Comment 3:** (third paragraph on page 2): The potential impacts of this project on fishery resources is exacerbated by the multitude of private and Federal projects proposing beach nourishment or nearshore disposal of dredged material, hurricane protection, or the beneficial use of dredged material generated by maintenance of Federal navigation projects. However, insufficient information is available to adequately address the impacts of beach nourishment on various life stages of fishery resources that utilize the surf zone as habitat. Without a better understanding of this issue, adverse impacts to EFH could be underestimated for this and future projects involving beach nourishment.

**Corps Response:** See **Corps** responses to NMFS Comment 1 and NMFS Comment 13 addressed in Paragraph 5.01 above.

**NMFS Comment 4** (first paragraph on page 3): The NMFS also is concerned that blasting for rock removal in the upper Cape Fear River will adversely impact larval fish. We have previously identified this as an important category of impact for which limited data are available. Air bubble curtains were proposed in the original plans to ameliorate the impacts of blasting on fishery resources. However, the study of the bubble curtains concluded that they were ineffective in reducing mortality in juveniles of selected fishes. As a result, their use is removed from the modified project plans. Instead, seasonal restriction on blasting and blast pressure limits are incorporated into the project to mitigate the impacts of blasting. However, larvae and juveniles of federally managed species such as red drum are present in the estuarine water column during the period when blasting is allowed. Furthermore, blasting will occur close to the PNA's that are located in the upper reaches of the Cape Fear River. Because the effectiveness of controlling blast pressures to reduce impact to larvae is untested, there is no way to ascertain that this measure will avoid or minimize impacts to fish.

**Corps Response:** See Corps responses to NMFS Comment 2 addressed in Paragraph 5.01.

**NMFS Comment 5**, (second paragraph on page 3): A comprehensive dredging and dredged material disposal plan is an important component of the modified project. One aspect of the plan is to eliminate the seasonal restriction on dredging in the Ocean Bar II Contract (OBIIIC) area. We cannot support this proposal unless a more geographically and seasonally limited restriction is imposed. An alternative seasonal restriction that would prohibit dredging in January, February, and March for the Smith Island Reach of the OBIIIC area would avoid potential impacts to larvae of estuarine-dependent species and adult anadromous fish that are migrating into the river during this period.

**Corps Response:** See Corps responses to NMFS Comment 3 addressed in Paragraph 5.01.

**NMFS Comment 6** (third paragraph on page 3): Our March 15, 2000, comments on the EA addressed the paucity of information on the impacts of beach nourishment and blasting on fishery resources, especially early life stages. Included was a memo from the CCFHR that provided a brief overview of the types of studies that could address the impacts of beach nourishment, rock blasting, and project related changes in tidal elevations on early life stages of fishery resources. NMFS also advised that based on the review of the EA and assessment of potential adverse impacts to fishery resources in general, Federally managed fishery resources, and EFH, the final project design should incorporate measures to ensure that impacts can be quantified and mitigated. Accordingly, NMFS recommended that mortality of early life stages of fishes associated with the blasting necessary for channel excavation should be quantified and any significant impacts should be mitigated. Further, channel dredging in the Smith Island reach of the OBIIIC should be scheduled to avoid work from January through March. Also provided were EFH recommendations designed to ameliorate EFH impacts. These recommendations remain relevant and are reiterated here for your consideration.

1. The project should be designed to avoid adverse impacts to surf zone habitats and associated fisheries. Otherwise, measures must be specified to offset the adverse impacts.

2. Measures necessary to compensate for unavoidable adverse impacts to EFH should be coordinated with the NMFS and incorporated as components of the overall project design and budget.

We believe that our concerns warrant additional monitoring and research to quantify the magnitude and scope of fishery impacts associated with fill placement in surf zones and blasting for rock removal. If the above concerns are not resolved, the NMFS cannot concur with a Finding of No Significant Impact for the project as proposed in the EA and, in accordance with the National Environmental Policy Act implementing regulations from the Council on Environmental Quality, Section 1502.9(c)(1), must recommend that a supplemental Environmental Impact Statement be prepared.

**Corps Response:** See Corps response to NMFS Comment 15 addressed in Paragraph 5.01 above.

**5.03 U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Service, Center for Coastal Fisheries and Habitat Research (CCFHR), letter dated March 13, 2000 commenting on the EA.**

**CCFHR Comment 1** (first paragraph on page 1): There are three areas of concern relative to potential project impacts on fishery resources: 1) Impacts from beach nourishment; 2) impacts due to blasting; and 3) impacts on Essential Fish Habitat.

**Corps Response:** Noted.

**CCFHR Comment 2** (second and third paragraphs on page 1 and first paragraph on page 2): Beach Nourishment Impacts; The impact of beach nourishment on larval and juvenile fishes is unknown. This is because the current state of knowledge on the distribution, abundance and species composition of larvae in the surf zone is very limited. A similar poor level of understanding exists for the use of the surf zone as nursery habitat for juveniles. In fact, the USCOE, Wilmington District, in reference to the construction of a weir jetty at Oregon Inlet, has previously recommended studies to document the abundance, diversity, migration, and distribution of larval and juvenile surf zone fishes. Such studies have not been conducted. While studies at other North Carolina inlets have shown very high concentrations of young estuarine-dependant and coastal species, many of which are of substantial commercial and recreation importance, in waters just outside the surf zone along the barrier beaches, we know nothing about their concentrations from mean high water out into the surf zone.

It has been postulated that larvae may pool in near-shore waters prior to moving into inlets on flood tide. From studies conducted at Oregon Inlet, Ocracoke Inlet and Beaufort Inlet we have found that larvae are not equally distributed around the inlet delta or in the pass. Samples collected along the ebb-tide delta in waters ranging from 4.6 to 7.6 m (15 to 25 ft) show that larvae are often abundant at these depths. Larvae tend to be more abundant on the upcurrent approach to inlets indicating that most are poised to enter the inlet from a lateral longshore direction and not via the main navigation channel. Within the inlet throat, we have found that larvae are considerably more abundant along the inlet edge than in mid-channel. Several kilometers offshore from the inlet mouth, the abundance of larvae is quite variable and probably reflects the movements of discrete patches of larvae.

Although we know that larvae can be abundant in relatively shallow waters near the inlet we do not know their abundance in the surf and near-shore zones of adjacent beaches. Therefore, the impact of beach nourishment on larval ingress cannot be reliably estimated. There is a clear need to determine the



distribution of larvae and juveniles in the near-shore environment likely to be impacted by nourishment activities. Additional research should be conducted to determine the distribution and abundance of larval fishes in the near-shore habitat, their relative contribution to the number of larvae which successfully migrate through the inlet and the impact of spoil deposition on mortality. In the absence of such information, potentially significant impacts cannot be ruled out. A carefully designed study to determine near shore gradients of larval concentration and juvenile abundance, before, during and after spoil deposition, is necessary in order to determine the impact of beach nourishment.

**Corps Response:** See Corps response to NMFS Comment 1 addressed in Paragraph 5.01.

**CCFHR Comment 3** (second and third paragraphs on page 2 and first paragraph on page 3):  
Blasting Impacts; The proposed blasting during channel deepening in the upper project area will undoubtedly result in mortality of some organisms. The concern about impacts of blasting on living resources is focused on mortality of fish, turtles and marine mammals. This emphasis is predicated on public interest in these animals and their relatively high sensitivity to pressure changes generated by underwater explosions. While limited numbers of other species, which are in close proximity to a blast, will be killed, those with gas filled organs (i.e., lungs or swimbladders) are vulnerable at a greater distance. To some extent, blasting mortality can be minimized by not blasting when these animals are not distributed in the affected area, or mortality may be predicted from models based on prior studies. Unfortunately predictions about fish mortality are not very precise for a variety of reasons including primarily: 1) uncertainty about their distribution (i.e., how many individuals will be exposed, at what depth, and at what distance from the blast; 2) species-specific differences in sensitivity; and 3) uncertainty about precision and accuracy of existing models which have been developed from data collected in different ecological systems or conditions. We recommend that blast impacts be monitored based on the concern that current model predictions of mortality are insufficient. Efficient design of a monitoring plan calls for the effort allocated in a manner proportional to the uncertainties inherent in predicting impacts and the management concern about such impacts. Assuming that marine mammal and protected species problems will be dealt with by timing of the blast, the major mortalities of concern will be of fishes.

Models for prediction of lethal impacts on large juvenile and adult fishes are fairly robust; thus, their total mortality can be predicted with reasonable accuracy, provided fish abundance and distribution are known. Unfortunately, the abundance and distribution of late-stage juvenile and adult fishes is both highly contagious. However, if we assume that estimates of the lethal area surrounding the blast are accurate, and that the blast areas are not, for some unknown reason, areas of special concentration (e.g., a migration route) the conclusion that blasting will have no significant adverse impact to these groups of fishes seems reasonable. Estimation of actual blast induced mortality on these populations would be expensive and of little management value. Limited sampling immediately after a few blasts will be sufficient to document the relative size and species composition of observed nekton mortalities.

Impacts on early-life-history stages of fishes should be the focus of monitoring efforts because large numbers of larvae and early post-larval juvenile fishes will be exposed and there is little information from which to predict the magnitude of detrimental effects. Because blasting will occur within a rather narrow migratory pathway for these fishes, a substantial fraction of that area's population may be impacted. The sensitivity of these stages has not been measured. Based on the increased sensitivity with

decreasing fish size shown in published models, the blasting impacts may be expected to be large. However, extrapolation to these smaller fishes may not be valid and requires testing.

**Corps Response:** See Corps response to NMFS Comment 2 addressed in Paragraph 5.01 above.

**CCFHR Comment 4** (second and third paragraphs on page 3): Impacts on Essential Fish Habitat (EFH): Primary Nursery Areas (PNA); Two of the most important factors affecting distribution and composition of estuarine emergent wetlands, an identified EFH, are salinity and tidal range. As a consequence of nekton dependence on these marshes, subtle changes in marsh attributes (e.g., areal coverage, hydroperiod, plant density) can substantially influence fishery production. Due to the predicted project-related increase in tidal range, changes in plant and nekton communities of PNA are expected and may be significant. Change in marsh plant distribution and dominance could alter habitat function and changes in salinity and tidal range may have substantial effects on nekton use. To determine the effect of these changes on the function of these important nursery habitats, it is essential that monitoring be conducted. The monitoring study should be designed to facilitate comparison with existing data from pre-project studies and should include: 1) monitoring the distribution, abundance and species composition of marsh plants and nekton; 2) monitoring the trophic structure of the community to detect shifts in predator-prey interactions; 3) monitoring changes in topography and sediment characteristics; and 4) monitoring changes in the areal distribution of dominant vegetation at each PNA site using a combination of low-level aerial photographic interpretation and established ground-truth methods. Monitoring should proceed over the duration of the project and for several years thereafter. This will allow examination of possible differences in nekton use patterns in PNA prior to, during and after the harbor project. Such an effort would provide useful long-term data and permit the detection of significant impacts on the marsh plant and nekton community due to the harbor project.

As part of a NMFS-supported EFH study conducted in 1998-99, estuarine ecologists at the Beaufort Laboratory investigated nekton using *Spartina* and *Phragmites* marshes located in PNA within the Cape Fear River complex (i.e., Cape Fear, Brunswick and Northeast Cape Fear Rivers). That study showed that these habitats supported a diverse nekton community with high abundance and biomass of important fishery species. Federally managed species (i.e., South Atlantic Fishery Management Council Fishery Management Plans) collected included pink shrimp, white shrimp, gray snapper, crevalle jack, sheepshead, red drum, and bluefish. In addition, other important fishery species collected included blue crab, Atlantic menhaden, white perch, spot, croaker, speckled seatrout, white mullet, striped mullet and southern flounder. Therefore, these highly productive marshes have potentially important ramifications in terms of higher order estuarine food web and fisheries support. Previous work established baseline conditions for EFH and nekton use in project area PNA. Continuation of this work over the project period and for at least two years beyond project completion would provide extremely useful information on PNA nekton response to large system-wide hydrologic changes with potential application to similar navigation projects.

**Corps Response:** An extensive monitoring plan is currently being conducted in the Cape Fear and Northeast Cape Fear River related to potential impacts of the proposed Wilmington Harbor deepening project. The commitment for this monitoring was made in the 1996 EIS for the project and the monitoring plan was coordinated with your agency and all other appropriate agencies. The monitoring includes tidal



range and salinity in the rivers and adjacent marsh/swamp, chemistry of the marsh/swamp soils, vegetation sensitive to changes in soil chemistry and inundation frequency, use of the tidal marsh/swamps by fish, benthos, epibenthos, and decapods. This monitoring will be conducted about 2 years prior to extensive dredging actions, during construction and about 2 years after construction is complete. This level and duration of monitoring is adequate to assess the potential impacts of the project, and no additional monitoring is needed.

**5.04 U.S. Environmental Protection Agency, Region 4 (USEPA), letter dated March 22, 2000 commenting on the EA.**

**USEPA Comment 1** (first paragraph on page 1): Pursuant to Section 309 of the Clean Air Act, EPA, Region 4 has reviewed the subject document, viz., an examination of the consequences of six major modifications to the original WHP upgrade (which had recently been evaluated via an environmental impact statement [EIS]). When the administrative processing of the EA is completed, the District anticipates issuing a "Finding of No Significant Impact" (FONSI) for these design changes. The proposed modifications to the WHP are extensive in scope and have the potential to engender a number of conditions which could become problematic from an environmental perspective. However, this action also provides some important opportunities to enhance certain environmental amenities (turtle nesting capability) which have recently declined in value/areal extent. The operative issue for all the involved parties will be minimize the former problems and maximize the latter possibilities.

**Corps Response:** The Wilmington District has coordinated extensively with stakeholders and regulatory agencies to refine project opportunities to achieve an optimum balance between competing interests.

**USEPA Comment 2** (second paragraph on page 1): We suggest that before a FONSI is issued for this action, a conference call be set up among the principal agencies to discuss the proposed modifications:

**Corps Response:** The Wilmington District has contacted individual agencies to discuss their comments when additional coordination was needed.

**USEPA Comment 3** (third paragraph on page 1): Our chief procedural concern about these modifications is their environmental scope and the precedent of examining them via an EA in lieu of a supplement to the final EIS. Generally, changes of this magnitude are assessed in the context of an EIS format. Notwithstanding the fact that the District has primacy in regard to the election of how comprehensive the evaluation context will be, this decision is at variance with the preponderance of other similar (size and geographic extent) projects in which the District is the lead agency. We understand there are exigencies associated with meeting the initial timetable set for project milestones. Nonetheless, this determination has ramifications beyond just this project and needs to be discussed further to reach consensus.

**Corps Response:** Proposed modifications of Wilmington Harbor, including deepening, widening, seaward extension of the ocean bar channel, and blasting, have been the subject of a number of EIS and

EA reports prepared by the **Corps** since 1989. The latest EIS released in 1996 (and discussed on pages 14 and 15 of the EA) is being supplemented by the present EA.

This procedure is allowed by **Corps** of Engineer Regulations for Implementing the National Environmental Policy Act (33 CFR Part 230, Appendix A, Paragraph 3.a) for projects in the Preconstruction Engineering and Design phase and the Construction phase, which represent the present and near-term status, respectively, for the Wilmington Harbor project. As is discussed on pages 43 and 44 of the EA, the elements of the proposed action are expected to reduce the overall impacts of the proposed Wilmington Harbor improvements when compared to the impacts described in the 1996 EIS, and the cumulative impact of these changes is also expected to be minor.

A primary issue of concern seems to be the proposal to provide sand for disposal over 14.2 miles of beaches in Brunswick County over a continuous work period of 18 months. A major part of this concern stems from the failure to recognize that over half of this work is scheduled to occur during the cold-weather months outside the season of concern for nesting sea turtles and intertidal invertebrates and that the portions of beach scheduled to receive sand during the turtle nesting season are in badly eroded condition due to the 6 hurricanes that have passed through the area in the last 4 years; consequently, these stretches of beach offers poor turtle nesting habitat. The standard sea turtle nest monitoring and relocation program would be followed, as appropriate during construction, and the post-construction beach is expected to provide improved habitat for turtle nesting. In addition, the **Corps** will address this concern through the development of an integrated monitoring plan aimed at identification and quantification of beach disposal impacts on sea turtles, larval and juvenile fishes, shorebirds, and surf zone invertebrates. It is anticipated that this plan will be developed through coordination with all interested agencies or individuals and that it will be implemented in the fall of 2000. Therefore, we do not see this proposed work as a significant adverse impact. See paragraph 11.00 of this FONSI regarding monitoring and other environmental commitments.

Analysis and coordination of the various aspects of the proposed action have not revealed that they would result in significant adverse impacts to the environment. Also, it is unclear what would be accomplished by imposing another step in the reporting process, other than increasing the time requirement and the cost to the taxpayer. Therefore, we believe the EA/FONSI format sufficiently addresses the requirements and intent of the National Environmental Policy Act and that a Supplement to the EIS is not required.

**USEPA Comment 4** (first paragraph on page 2): On a substantive basis there is a **lack of specificity about certain critical design items** (emphasis added). For example, the disposition of all (or even most) of the excavated material resulting from the initial construction remains in discussion. Since beach quality material is a valuable commodity, many nearby coastal communities experiencing natural erosion processes are interested in acquiring the sand. A number of sites are mentioned as possibilities for receiving nourishment material. However, actual commitments by the noted communities/beach consortia continue to be examined and await other procedural actions. Similarly, it is reasonable to assume that an ocean capable hydraulic dredge will be used to initially excavate most offshore material. However, other material may need to be handled by other dredge systems and/or transshipped by barge, pump systems, or other means. The type equipment used in this instance will only become known after the

FONSI. Because amounts of material and the manner by which it is obtained/manipulated can have an important effect on an action's long-term environmental ramifications, this matter needs to be clarified.

**Corps Response:** The noted lack of specificity correctly identifies such details as "design items." Such items cannot be fully addressed until final design plans are developed. The final design estimate is now 5.6 million cubic yards of sand to be placed on the beach. Placement of sand on the beach will be either by pump out of a hopper dredge or using a hydraulic pipeline. Both of these methods will have similar impacts on the beach, but the dredging/excavation methods can have different impacts. These potential impacts are discussed in the EA.

Over the several decades that the Wilmington District has been conducting beach placement of dredged material, final design plans have always proposed the placement of only beach quality sand. Additional information on this subject is provided in the Corps response to NMFS Comment 4 of the letter addressed in Paragraph 5.01 above.

Paragraph 1.04.6 of the EA beginning on page 9 describes the various aspects of the Wilmington Harbor dredging program and discusses the proposed expansion of dredging methods. As is noted on page 11, any dredging methods employed would be required to be consistent with appropriate environmental protection measures, including those imposed to safeguard water quality, fish and wildlife, and endangered and threatened species. The amounts of dredged material proposed for disposal are described in the EA in terms of the assumed maximum case. The identification of exact amounts comprising smaller quantities is not required.

**USEPA Comment 5** (second paragraph on page 2): When exact locations are eventually determined emplacing excavated material at many of the suggested beaches (together with the reduced amount of blasting now considered necessary) will not be accomplished without adverse effects. Resource agencies are especially concerned about impacts on endangered species. The sequence of avoidance, minimization, mitigation, and compensation must be employed in this regard. A practicable solution to maximize the mandates of all parties in this regard may not be easy, but must be achieved.

**Corps Response:** It is expected that all beach disposal activities associated with proposed action can be completed without adverse effects to endangered and threatened species. Continuous disposal on the beach for an 18 month period is a maximum case scenario and was indicated in case it did occur due to unexpected contract and equipment delays. Currently we believe that a 14-month period is more likely if up to 6 million cubic yards of sand is placed on the beaches. However based on recent data from the ocean bar area, the total volume should be closer to 5.6 million cubic yards, which probably means something less than 14 months. Over half of the work is scheduled for completion outside the seasonal turtle-nesting window. The portion of work that would occur within the turtle window involves a stretch of severely eroded beach which offers poor nesting habitat. Nevertheless, the standard nest monitoring and relocation program would be implemented for the construction beach during the turtle window. The post-construction beach should provide improved nesting habitat for sea turtles.

New Hanover County beaches that receive sand from the Wilmington Harbor project would comply with requirements imposed during their authorization. Therefore, sand placement on New Hanover County

Beaches would not be accomplished during the turtle nesting season, to the maximum extent practicable. It is not proposed to place sand on New Hanover County beaches on a year-around basis.

Potential impacts to surf zone biota are discussed in the Corps response to NMFS Comment 1 addressed in Paragraph 5.01 above.

**USEPA Comment 6** (third paragraph on page 2): Sediment characteristics of material used in beach nourishment need to be more definitively ascertained, especially in regard to their compatibility with native material. There are numerous cases in which all parties assumed that since the sediments were proximate to a receiving beach and/or in a high energy system that acceptability was a given. Unfortunately, excessive subsequent turbidity and/or accelerated erosion demonstrated that this was not the case. Some important effects of construction activities and their impacts on sensitive marine communities are directly related to the percentage of fine grain material encountered/involved. We are particularly concerned about the effects of long-term turbidity on nearshore biota as fines winnow from deposited material. Fundamental changes in the structural characteristics of the impacted nearshore communities are a distinct possibility absent a reasonable understanding of the textural classes involved. Since this project has such a large geographic context, the cumulative aspects of the proposal are significant and warrant further analysis/consultation.

**Corps Response:** The criteria used to determine the suitability of the dredged material for disposal on the adjacent beaches was based on limiting the percent fines (i.e., the percentage of material passing the 200 sieve) to 10 percent or less. Based on this criterion, of the total of over 15.4 million cubic yards of material to be removed to construct the new entrance channel, approximately 5.6 million cubic yards was determined to meet this criterion. In addition, the material that passed the 10 percent fines criterion was subjected to a compatibility analysis to determine how its size distribution compared with the native beach sand. In general, the material designated as suitable for disposal on the beach was found to have overfill factors ranging from 1.0 to 1.2. The overfill factor is a mathematical representation of the match between the size characteristics of a borrow sediment with that of the native beach sand. A value of 1.0 means that the material is basically an ideal match. Overfill factors of 1.3 and lower are also considered to be very good matches with the native sands. The dredging operation for constructing the new entrance channel includes depth restrictions to assure that only the beach quality material is placed on the adjacent beach. For example, while the design depth of the entrance channel is set at 44 feet below local mean lower low water (mllw) plus two feet of allowable over depth (-46 feet mllw), the contract for placement of the material on the beach will include depth restriction in portions of the channel somewhat above this maximum channel depth. The contract restriction along with monitoring of the beach disposal operation will result in minimum turbidity during placement.

**USEPA Comment 7** (first paragraph on page 3): Construction activities in marine system invariably produce effects which were not initially anticipated. Given the size of this operation, experience suggests that there will be induced erosion/accretion, changes in the overall sand budgets of the nearby beaches and associated littoral zones, etc. Unfortunately, these consequences often manifest themselves after construction is long finished thereby requiring ever larger and more elegant "fixes" to mitigate the impacts of the original work. The EA would be improved together with ultimate decision-making in this instance if examples of these unforeseen consequences (occasioned by similar type projects) were discussed and what measures the District brought to bear in solving/mitigating these unintended effects.

**Corps Response:** The Corps of Engineers acknowledges that some of the impacts of the project could be unexpected and not predictable by modern technology. Accordingly, a detailed project monitoring plan is included in the sand management package. In the beach disposal areas, elevation profiles will be performed at 500-foot intervals twice a year (spring and fall) from the back toe of the dune to wading depth. In the same area, in water profiles will be taken at 1,000 foot intervals once a year to coincide with the spring onshore survey. The profiles will be from the beach out a distance of 15,000 feet or a depth of 25 feet whichever is encountered first. Vertical aerial photographs will be taken every year generally near the time of the spring profile survey. See paragraph 11.00 of this FONSI regarding monitoring and other environmental commitments.

The purpose of the monitoring plan is to determine the actual response of the system to the physical changes resulting from the project. The observed changes will be used to direct the beach placement of littoral sediment removed during maintenance of the project. In any event, the sand management plan presented for the Wilmington Harbor 96 Act project will probably improve the condition of the adjacent beach near the entrance to the harbor by keeping littoral sediments in the active littoral zone rather than removing the material from the nearshore littoral environment.

#### **5.05 Fish and Wildlife Service, letter dated March 30, 2000**

**FWS Comment 1** (page 1, paragraph 1 & 2): The U.S. Army Corps of Engineers (Corps) issued a Final Environmental Impact Statement (FEIS) for the Wilmington Harbor 96 Act project in May 1996. Since that time the Corps has made six preconstruction modifications to the Wilmington Harbor 96 Act project. The U.S. Fish and Wildlife Service (Service) issued a Draft Supplemental Fish and Wildlife Coordination Act (FWCA) Report for these project modifications in December 1999. The Service has reviewed the subsequent Environmental Assessment (EA) for Preconstruction Modifications of Authorized Improvements, Wilmington Harbor, North Carolina, CESAW-TS-PE-00-65-0003 issued on February 24, 2000. The following comments do not constitute the report of the Secretary of the Interior as required by Section 2(b) of the FWCA.

This additional review under the National Environmental Policy Act of 1969 (NEPA) has been necessitated by six preconstruction modifications to the original project. These modifications to the Wilmington Harbor 96 Act project are: (1) construction and maintenance of the harbor entrance channel (Bald Head Shoal Channel) along a new alignment through the ocean bar to the northeast; (2) backfilling the abandoned portion of the old ocean bar channel with material unsuitable for beach or littoral zone placement; (3) placement of up to 6 million cubic yards (mcy) of sand dredged from the ocean bar channel, riverine channels upstream through Reaves Point channel, and/or the larger sandy disposal islands of the lower Cape Fear River on area beaches or in the littoral zone; (4) placement in the Offshore Dredge Material Disposal Site (ODMDS) of all dredged sediment that does not go to the beaches, the littoral zone, or abandoned channel; (5) establishment of a clear, comprehensive plan for utilization of all types of dredging equipment and disposal alternatives that are appropriate for use in each specific portion of the project; and, (6) reduction in the area requiring rock blasting, number of blasts, and size of each blast, plus elimination of the bubble curtain to protect aquatic resources during blasting. Two beaches, Bald Head Island and Caswell Beach are currently proposed to receive maintenance dredging spoil disposal over the life of the project.



**Corps Response:** noted.

**FWS Comment 2** (page 2, General Comments, paragraphs 1 & 2): Under the NEPA an EA is a decision making document. An EA is produced when the federal action agency is unsure about the significance of the environmental impacts of the project under consideration. The EA is evaluated and project impacts are found to be either insignificant or significant. If impacts are found to be insignificant, the federal agency may release a Finding of No Significant Impacts (FONSI) and the NEPA process is essentially concluded. If the overall impacts are found to have significant impacts, the planning process must move on to the preparation of a Draft Environmental Impact Statement (EIS).

The Service is concerned with the preliminary conclusion of the Corps regarding the significance of the aggregate impacts of the proposed modifications. The EA ends (P. 59) with the statement that the proposed action is not expected to significantly affect the quality of the human environment. The Service strongly believes that such an expectation is premature. We believe a more comprehensive evaluation of impacts with forthcoming data will demonstrate significant impacts. Furthermore, the Service believes that certain adverse environmental impacts that can now be reasonably assumed to occur are significant.

In general, the Service finds the level of impact analyses to be incomplete and inadequate for four reasons. First, important technical information has not yet been fully analyzed and thus the complete nature of certain project impacts cannot be established. Second, even with rather complete data some project impacts have been addressed in only a cursory fashion. Third, the EA fails to fully consider the cumulative impacts of the beach disposal component of this project in the context of other ongoing beach nourishment projects and beach nourishment projects that are now being planned. Fourth, there is the overriding issue of whether the proposed project impacts in the aggregate would have a significant or insignificant impact on the resources of the project area. We will elaborate on these issues with our specific comments.

The Service believes that a complete description of project impacts and a thorough analysis of their significance constitute an essential component of NEPA. Compliance with the disclosure requirements of the NEPA allows the Service to monitor federal trust resources under our jurisdiction and work with the Corps and other federal agencies to develop adequate mitigation measures. If adverse impacts are systematically underestimated resources such as migratory shorebirds and certain fish species that depend directly and/or indirectly on the beaches and waters of the project area will be adversely affected.

**Corps Response:** We have reviewed all the comments received on the EA. Based our review of these comments and investigations required to respond to the comments, we believe that the EA/FONSI is an appropriate document for the proposed action and it fully complies with NEPA. A draft and final Environmental Impact Statement (EIS) and Record of Decision was prepared on the authorized project in 1996. The EA only addresses the modification since the EIS, and the preparation of an EA to supplement an EIS is allowed under our regulations (30 CFR 230 Appendix A 3). This signed FONSI is being circulated to all parties commenting on the EA and it will be provided to anyone else requesting a copy through the notice of availability that is being issued. We have provided detailed responses to specific comments below.

**FWS Comment 3** (page 2, Specific Comments, bottom paragraph): As noted, the Corps will issue at least one more NEPA document for these proposed modifications. The next document may be either a FONSI or a Draft EIS. The Service is primarily concerned with the adequacy of the planning process mandated by the NEPA. Therefore, we request that the concerns provided below be addressed in the next NEPA document.

**Corps Response:** All your comments have been addressed in this FONSI.

**FWS Comment 4** (page 3, Inadequate Analysis Due to Lack of Data or Incomplete Plans, paragraph 1): Sediment compatibility is crucial to evaluating environmental impacts of beach disposal. Without these data the EA is incomplete and the Service cannot evaluate the impacts of the beach disposal to fish and wildlife resources. However, the Corps has not yet completed the technical analysis of sediment that would be dredged. The Service requested the geotechnical information relating to this project, and has received most of what is available at this time. However, core samples between stations 0+00 and 120+00 of Bald Head Shoal Channel were not taken until January 2000. These samples have not been fully processed and available for review at this time. Sediments from this section are proposed for beach disposal. While other data suggest that this material will be beach compatible, no data are presented in the EA to support such compatibility. However, the EA states (p. 27) "compatibility analysis ... of the new dredge material ... indicates a good match" for beach disposal. The Corps assumes that all of the sediment from this reach will be beach suitable, while adjacent data suggests that might not be the case (i.e., dredging will hit mud before reaching the new channel depth). Furthermore, no samples were taken seaward of station 190+00 to prove that all of the seaward sediments were not beach suitable materials. This includes the section of the new channel that runs through the Offshore Dredged Material Disposal Site (ODMDS), where beach suitable material has been dumped in the past.

**Corps Response:** As of April 13, 2000, the Service has been provided all the information we have on the January 2000 sampling. Therefore the Service now has all the information we used to determine the quantity and quality of sand to be placed on the beaches. Several samples were taken adjacent to the proposed channel seaward of station 190+00. This information along with the data between stations 190+00 and 170+00 indicated that there is no appreciable amount of beach quality sand in that area. Most of the dredged material deposited in the ODMDS had a high silt content and thus would be unacceptable for beach disposal, and we have no sediment samples indicating the presence of significant quantities of sand in the ODMDS.

**FWS Comment 5** (page 3, paragraph 2): The amount of sand that would ultimately be placed on project area beaches has not been determined. The EA notes (p. 6) that the maximum quantity is "... not expected to exceed 6.0 million cubic yards." However, the Sand Management Plan (SMP) notes (Appendix A, p. 4) that the maximum volume "... may be reduced by 20 to 30 percent depending on final quantitative and qualitative analysis and actual dredging operations associated with the dredging contractors decisions to obtain the allowable overdepth." Therefore, the actual amount of sediment that could end up on the beaches may range from about 4 million to 6 million cubic yards providing that no sediments seaward of station 190+00 are beach suitable.

**Corps Response:** When you were provided the final results of the January 2000 sampling on April 13, 2000, included was the final volume estimate of 5.598 million cubic yards. Maintenance dredging requirements in the inlet area can fluctuate from year to year; therefore, maintenance dredging required in the existing channel just before and just after the new work dredging could cause the 5.6 million cubic yard volume to fluctuate plus or minus 0.36 million cubic yards.  $5.6 \pm 0.36 = 5.96$  million cubic yards is close to the maximum of 6.0 million cubic yards indicated in the EA. Therefore, the widths and lengths of beach disposal indicated in the tables on pages 6 and 7 of the EA are still good estimates.

**FWS Comment 6** (page 3, bottom paragraph and on page 4 paragraphs 1 & 2): In addition to the uncertainties regarding the quantity of beach disposal material, the actual length of beach to receive the material is uncertain. The EA (p. 16) states that "... it is possible that all sand may not go to the beach destinations due to funding constraints, seasonal restrictions to protect endangered and threatened species, or other unforeseen reasons." The SMP presents two disposal plans. The base plan would move sand to only Bald Head Island and Oak Island Caswell Beach, a beach length of approximately 7.8 miles. The second, larger option is contingent on federal funding under Section 933 of the Water Resources Development Act of 1986 (Public Law 99-662). If this federal assistance is provided, disposal would be expanded to western Oak Island (25,600 feet) and eastern Holden Beach (10, 600 feet) for a total additional disposal area of approximately 6.9 miles. The overall base plan plus the Section 933 area would result in beach disposal along 14.7 miles of beach. Negotiations are ongoing with local communities to secure this federal assistance. Sand distribution is ultimately dependent upon the results of coordination with the project sponsor (State of North Carolina) and the beach communities, as well as economic and engineering constraints. Constructed and naturally adjusted berm widths will likewise depend upon the plan selected (EA, p. 5).

The EA notes (p. 17) that the "sand that may go to New Hanover County beaches has not yet been designated." These beaches are under consideration to receive 0.6 million cubic yards of material from new work within the channel. One area under consideration is the 7,000 feet south of the rock revetment at Fort Fisher. This beach would be a new site of dredge disposal that the EA does not fully discuss. The Fort Fisher area is known for its unique, nearshore coquina rock outcrops, which would be impacted by any spoil disposal at that location.

The exact magnitude of project impacts ultimately will depend on the determination of sediment volume and length of the disposal area. The present uncertainties create two extreme scenarios. First, the maximum amount of material could be placed on the minimum length of beach. Second, the minimum amount of material could be placed on the maximum length of beach. In the former case, the shorter project length will place a much greater volume of sediments in a confined area and thus intensify the magnitude of impacts. In the latter extreme, a longer project length would spread the impacts over a wider area but probably decrease the magnitude of impacts for a stretch of beach. Overall, the Service believes that environmental impacts associated with beach disposal cannot be evaluated without a detailed description of the volume of dredge spoil and the exact location and spatial length over which this material will be placed.

**Corps Response:** As indicated above, we estimate that 5.6 million cubic yards of sandy dredged material is acceptable for beach nourishment. This may fluctuate plus or minus 0.36 million cubic yards depending on maintenance dredging required in the existing channel just before and just after the new



work dredging. Thus up to about 6.0 million cubic yards ( $5.6 + 0.36 = 5.96$ ) could be disposed on the Brunswick County beaches. Since the EA indicates that a maximum of 6.0 million cubic yards could be placed on the beaches, the widths and lengths of beach disposal indicated in the tables on pages 6 and 7 of the EA are still good estimates.

We requested that you comment on the potential impacts of two alternatives regarding beach disposal. The data for the two alternatives were presented in the table on page 6 and in the table on page 7. The only difference now is that in the EA the data represented two alternatives with a maximum case width based on 6 million cubic yards. Now we have the same two alternatives with an estimated volume of 5.6 million cubic yards with a maximum case scenario of 5.96 million cubic yards.

The estimated amount of sand going to the New Hanover County beaches is 1.9 million cubic yards (table 2 of the EA). As indicated on page 34 of the EA, the Federal shore protection projects are previously nourished beaches, and their periodic replenishment is planned and previously approved. The Fort Fisher Revetment project has not previously received sand replenishment, but this activity is approved when monitoring indicates that erosion rates exceed specific thresholds (Corps, 1995).

In addition, see Corps response to NMFS Comments 1&9 addressed in Paragraph 5.01 above.

**FWS Comment 7** (page 4, Inadequate Analysis of Environmental Impacts, Evaluation of Alternatives): Section 3.01 on the alternatives for the new alignment is vague and does not provide details on the other two alternatives (do nothing and eliminate bends from the channel). The section provides a summary of the preferred alternative rather than a detailed discussion of each alternative. Section 3.02 on the alternatives for beach disposal is also vague and considers only variations of one alternative when four were listed.

**Corps Response:** The information provided in the indicated sections are adequate. Detailed evaluations are not required for alternatives that are not environmentally acceptable or not economically feasible or have existing approvals (e.g. disposal in the ODMDS and existing disposal islands).

**FWS Comment 8** (page 4, Testing for Contaminated Sediment - Section 5.01 of the EA states (p. 28): that a 1992 analysis of the harbor sediments judged the material clean by an older set of contamination standards. The Service notes that data from Disposal Islands #3 and #4 that may be pumped out to provide material for beach placement show a significant mud content in many cores. Depending on the origin of this material, these sediments could contain contaminants and should be assessed. An assessment should also be provided as to whether 1992 sampling remains an accurate reflection of current sediment characteristics, which may include significant changes after the series of hurricanes that have struck the Wilmington area in recent years. The Service FWCA Report requested that newer standards be used (the Inland Testing Manual (ITM) adopted by EPA and the Corps in 1998) and that a wider range of sediments be assessed. The Corps responded (p. 48) that prior testing was adequate and no separate evaluation under the ITM is required.

**Corps Response:** Our response on page 48 of the EA is still appropriate. Some silty layers in some cores do not imply that the sediment is contaminated. All the testing performed in Wilmington Harbor including sediment samples taken in 1996 and outlined in the recent Tier 1 evaluation do not indicate

sediment contamination problems in the harbor. There is no reason to believe that the series of recent hurricanes have contributed to sediment contamination, and the silt layers in the cores from islands 3 & 4 would not have been exposed to any effects of these hurricanes.

All sediments proposed for beach disposal, whether from existing disposal areas or channels, contain 90 percent sand or greater and as such do not require testing under the Inland Testing Manual. The Section 404(b)(1) Guidelines for Specification of Disposal Sites For Dredged or Fill Material indicates in 40 CFR 230.60(a) that "Dredged or fill material is most likely to be free from chemical, biological, or other pollutants where it is composed primarily of sand, gravel, or other naturally occurring inert material." Also in accordance with this paragraph the sand proposed for beach disposal is in "areas of high current or wave energy" and the sand is not "discolored or contains other indications that contaminants may be present". The sediments in disposal island 3 and 4 were dredged from the adjacent high current sandy channels and placed in the islands by hydraulic pipeline dredge. The dredging process would also have helped wash the sediments of any contaminants that may have been present. In addition, a Tier 1 under the Inland Testing Manual must comply with 40 CFR 230.60 (a), (b), (c), and (d). The 404b evaluation included in appendix D of the EA satisfies these requirements.

The sediments that are less than 90 percent sand are planned to be disposed in the Wilmington Ocean Dredged Material Disposal Site (ODMDS), or the abandoned Bald Head Shoal Channel, or in the Eagle Island confined disposal facility.

**FWS Comment 9** (page 4, Bathymetric Changes): The Service FWCA Report recommended that the Corps make bathymetric surveys outside of the ODMDS buffer zone along the Bald Head Shoal Channel. The Corps responded (p. 49) that "Bathymetric changes that may occur outside authorized Federal navigation channels are not a concern of our maintenance dredging program and, therefore, are not monitored." This position precludes the detection of any alterations to the active littoral system that may be the result of the navigational channel and its maintenance, and thus prevents any data and subsequent mitigation for adverse impacts to adjacent nearshore and beach habitats in both the short and long-term.

**Corps Response:** Our response was related only to bathymetric changes for the navigation channel. The littoral zone will be monitored as a separate item as indicated in the Sand Management Plan in appendix A of the EA. See paragraph 11.00 of this FONSI regarding monitoring and other environmental commitments.

**FWS Comment 10** (Page 5, Elimination of Restriction on Dredging Operations): The Corps has not fully addressed the impacts to aquatic resources from the expansion of dredging methods and the use of overflowed dredges in estuarine waters. The EA discusses (pp. 37-38) monitoring in areas near Primary Nursery Areas (PNAs) but does not describe the impacts to fish and wildlife resources within and outside PNAs in sufficient detail.

**Corps Response:** Disagree. Impacts on expansion of dredging methods are adequately addressed and discussion begins on page 30, not just on pages 37-38.

**FWS Comment 11** (page 5, Non-beneficial Use of Rock): The EA states (p. 36) that rock could benefit the Wilmington Offshore Fisheries Enhancement Structure (WOFES) which has not reached its design dimensions. However, rock removed during construction that contained a substantial amount of fine sediment (silt/clay) would be considered unsuitable for disposal at the WOFES. Furthermore, the Corps states (p. 8) that "... other unforeseen reasons . . ." may preclude the disposal of rock in the WOFES. Rock that does not go to the WOFES would be placed in the ODMDS or at the Eagle Island confined disposal facility (CDF). If the spoil could be sifted to separate the rock from the finer sediments, disposal of the rock on the WOFES would be more beneficial to fish and aquatic resources than at the ODMDS or Eagle Island. The EA should discuss this option.

**Corps Response:** Sifting of rock from the finer sediments is not feasible. The rock resulting from blasting will range in size from pieces smaller than marbles to pieces larger than a desk. Designing and implementing a system to screen out such an array of sizes is just not economically feasible.

**FWS Comment 12** (page 5, Blasting in the River): The rock blasting in the river will undoubtedly kill some aquatic resources. The use of nets instead of bubble curtains may pose additional threats to aquatic resources that may become entangled in the nets. The EA fails to adequately address the significance of the aquatic resources that could be harmed by this modification.

**Corps Response:** The EA only discusses the modifications to project since the 1996 EIS. The use of gill nets to capture and relocate shortnose sturgeon to holding areas outside of the impact areas was discussed in the EIS. However discussions with FWS and NMFS has eliminated overnight set of gill nets, and have limited their set to a 3 hour duration. All nets will be equipped with surface floats with reflective tape to detect the potential entanglement of any marine mammals or sea turtles, and aerial and boat surveys of the blast area will be conducted prior to and after a blast. If a marine mammal or sea turtle is observed, the net will be retrieved or not set until they leave the area. Nets set in the dark (e.g. 4:30 a.m.) prior to any early morning blast (blast can't occur within 2 hours of sunrise), will require monitoring the surface water and net floats with night vision equipment, and using hydrophones to monitor for the presence of dolphin. See paragraph 11.00 of this FONSI regarding monitoring and other environmental commitments.

**FWS Comment 13** (page 5, Altered Beach Characteristics) Beach disposal may alter the sedimentology, stratigraphy, and profile of beaches. Changes in the grain size characteristics of the disposal beach, even if overall grain data are judged suitable, may result in alteration of sand compaction, shear resistance, moisture content, grain shape and grain size distribution. These changes may have biological significance for organisms that use beaches for feeding, resting, or reproduction. Beach invertebrate populations may be lower and community structure may show lower diversity. Lower productivity among beach invertebrates would result in reduced utilization of the nearshore waters by fish of commercial and sport interests. The value of the area as a feeding site for migrating shorebirds and macro-invertebrates would also be reduced.

**Corps Response:** There are some uncertainties about the impacts on beach nourishment. The key phrases in your comment are "Beach disposal may alter", "may result in alteration", "These changes may have biological significance", and "Beach invertebrate populations may be lower". Due to the uncertainties of the potential impacts of disposal of sand on the beach year-round, some additional

monitoring is justified. These uncertainties concern beach disposal impacts on sea turtles, larval and juvenile fishes, shorebirds, and surf zone invertebrates. The Corps will address these issues through the development of an integrated monitoring plan. This plan will be developed through coordination with all interested agencies or individuals, and it should be implemented by the fall of 2000. See paragraph 11.00 of this FONSI regarding monitoring and other environmental commitments.

**FWS Comment 14** (page 5, Mud and Turbidity): Geotechnical data indicate that there is a high mud content throughout most of the offshore project area and Disposal Islands #3 and #4 proposed for pump out to New Hanover County beaches. This information is not included in the EA, however, and the potential for high levels of nearshore turbidity and siltation resulting from beach placement of muddy material is not addressed. The environmental impacts from pumping out these disposal islands with high localized mud contents need to be considered in the EA.

**Corps Response:** All dredged material pumped to the beach will average 90% sand or greater. We are aware that there are some elevated silt and clay concentration in potential entrance areas to Islands 3 and 4. Only one of these islands is needed to obtain an adequate amount of sand to renourish Carolina Beach, Area South (Kure Beach). Any high concentrations of mud encountered in the entrance channel to an island, will be pumped to the island not being used for pump out.

**FWS Comment 15** (page 6, Summer Beach Disposal, paragraphs 1-3): The next NEPA document should fully consider the adverse impacts of beach disposal operations during the warmer months of the year. The current EA notes (p. 12) that proposed modifications would remove "... the seasonal restriction on beach placement of sand (currently allowed from November 15 through April 30)." The new construction schedule calls for beach disposal over 18 consecutive months (December 2000-June 2002). Heavy equipment on the beach, daily turbidity, new inputs of sand, continually reworked sediment and a host of other changing sedimentological characteristics are likely to create diminished habitat value for beach invertebrates, shorebirds, surf fishes and other trust resources. Furthermore, dredging projects with oceanic borrow and fill areas are notorious for lengthy weather delays during the winter, which could extend the construction period further into a second warm weather season.

Continuous dredge spoil disposal will impact beach invertebrate populations. In the project area, the warmer months constitute the period of greatest biological activity. Beach invertebrates such as the mole crab (*Emerita talpoida*) and coquina clam (*Donax variabilis*) colonize the beach in the spring and remain on the beach in high numbers throughout the summer and fall. Placement during recruitment seasons may significantly depress invertebrate abundances, which are the basis of the food web for many macro-invertebrates, surf fishes and shorebirds. The EA comments that extensive beach bulldozing has likely already depressed invertebrate population levels, but does not address that activity in the cumulative impacts of the project modifications as would be appropriate. The fact that certain resources have been depressed by other activities is not a valid excuse to proceed with other harmful measures that could be avoided.

Almost two complete shorebird-nesting seasons would be disrupted by the proposed beach disposal schedule. Area beaches attract numerous pelicans, gulls, and terns. Species that may nest on less-disturbed beaches include the Wilson's plover (*Charadrius wilsonia*), American oystercatcher (*Haematopus palliatus*), least tern (*Sterna albifrons*), and black skimmers (*Rynchops niger*). Both the royal

tern (*S. maxima*) and sandwich tern (*S. sandvicensis*) may be on area beaches during the summer. During the warmer periods of spring and fall shorebird migration, project area beaches represent feeding and resting areas for sandpipers and plovers.

**Corps Response:** This FONSI is the next and final NEPA document for this project. It along with the EA adequately addresses all the comments received. Continuous disposal on the beach for an 18 month period is a maximum case scenario and was indicated in case it did occur due to unexpected contract and equipment delays. Currently we believe that a 14-month period is more likely if up to 6 million cubic yards of sand is placed on the beaches. However based on recent data from the ocean bar area, the total volume should be closer to 5.6 million cubic yards, which probably means something less than 14 months. Therefore, disturbance will only occur during one nesting season. As indicated in the response to comment 12 above, there are some uncertainties related to the impacts of beach nourishment, therefore we will develop a monitoring plan to address pertinent issues related to beach disposal. See paragraph 11.00 of this FONSI regarding monitoring and other environmental commitments.

**FWS Comment 16** (page 6, bottom paragraph) The EA states (p. 42) that the additional cost of mobilizing-demobilizing dredges is \$5.25 million in order to avoid beach disposal during the warm weather season. Other project modifications will save the Corps an estimated \$60 million, or 11.4 times the savings from a continuous beach disposal work schedule. The additional costs of repeated mobilization and demobilization of dredges over three winter seasons instead of a consecutive 18-month period could be alleviated if the dredging equipment could shift activities from beach disposal to other disposal sites during the intervening summers. Beach suitable spoil may be stockpiled or the dredges could shift to dredging non-beach quality sediment during warmer months. The entire project schedule extends for 5 years, so effectively doubling the time to place dredge spoil on the beaches to 3 years will not compromise the rest of the project schedule. The purpose of the project modifications is not storm protection for beachfront communities. Delaying completion of the dredge spoil disposal from 18 to 36 months is not excused by the argument that it will delay protection of threatened oceanfront structures or infrastructure.

**Corps Response:** As indicated above, the construction period is more likely to be 14 rather than 18 months. If the dredge would switch from dredging sand in the cold months to non-sandy materials in the warmer months, cost would increase because of additional mobilization/demobilization between the beach and ODMS. We currently plan to perform the beach disposal and non-sandy disposal under two separate contracts. This will save at least a year of construction time in the inlet area. In addition to the \$5.25 million dollar saving, our schedule will provide an estimated annual net benefit of \$1.6 million in storm damage reduction on Oak Island, and order of work on the ocean bar will provide an economic benefit of \$2.1 million savings by providing a deeper draft on the ocean bar early on. Also, sea turtle nesting habitat would be created in an area where erosion has precluded such habitat at least one year earlier than would occur if construction were not continuous. If the dredge material were stockpiled during the summer warmer months, costs would greatly increase due to the need for double handling. However, the greatest problem would be finding a stockpile area that would not have major environmental problems. If the sandy dredged material is discharged at the rate of 400,000 cubic yards per month (5.6 million/14 months), a stock pile area big enough to hold 2.8 million cubic yards (400,000 x 7 months) would be required. Assuming the sand could be stacked in a cone 30 feet high, a stockpile area over 3,100 feet in diameter (173 acres) would be required. No such site is available.



**FWS Comment 17** (page 7, paragraph 1): EA discussion on Esthetic and Recreational Resources (p. 41) is the only section of the EA that describes the bulldozers, pipes, and other heavy equipment that will be necessary along the beaches while beach disposal is taking place. No discussion is given to the impacts of this equipment on beach compaction; invertebrate burrows; shorebird foraging, loafing and nesting; aeolian sediment transport rates and volumes; or the beach groundwater system. The EA does not indicate whether beach disposal would occur 24 hours a day with lights at night, or if the equipment will be removed from the beaches at night. However, normal operation of large hydraulic dredges that would work in the harbor is 24 hours per day and seven days a week (p. 31). Night work would also disturb homeowners trying to sleep at night, confuse birds in flight, and interfere with the activities of other nocturnal species.

**Corps Response:** Normal beach disposal actions would occur 24 hours per day, 7 days per week. From May 1 through November 15, all lighting on the beach associated with project construction will be minimized to the maximum extent practicable while maintaining compliance with all safety requirements. Reduced wattage and special fixtures or screens to reduce illumination of adjacent beach and near shore waters will be used if practical. The pipeline and equipment working on the beach will only be in areas where disposal has occurred or will occur. Therefore the pipeline and equipment will only be affecting what has or will be affected by disposal. Night work may disturb homeowners trying to sleep, birds in flight, and nocturnal species, but these impacts are not significant especially due to the small area affected at any one time.

**FWS Comment 18** (page 7, paragraph 2): The Service's FWCA Report recommendation concerning heavy equipment on the beach and night work activities is also not fully addressed. The Corps response (p. 51) provides no details and no conservation measures for fish and wildlife resources that would interfere with "work requirements." Likewise the recommendation regarding monitoring of escarpments and compaction of beach deposited dredge spoil is inadequate in that it does not provide any details regarding the timing, spatial extent, or reporting procedures for the monitoring. Standard monitoring procedures that the Corps utilizes for federal projects such as these should be outlined and discussed in individual NEPA documents for each project to which they are applied. This would allow full disclosure and public comment on the appropriateness of those procedures for each project. The Corps response (pp. 51-52) to recommended long-term monitoring at Bald Head Island and Caswell Beach is insufficient and provides no means for measuring long-term impacts to fish and wildlife resources. The monitoring of federally listed species mentioned is work conducted independent of this project rather than an addition to it. A similar response (pp. 53-54) was provided for the Service's recommendation for monitoring impacts on aquatic resources.

**Corps Response:** Our responses in the EA regarding the use of heavy equipment and monitoring of escarpments and compaction are adequate. Also see response to your comment 13 above regarding monitoring.

**FWS Comment 19** (page 7, Initiation of Long-term Beach Disposal): The current EA does not adequately consider the long-term environmental impacts of initiating a permanent beach disposal operation on Bald Head Island and East Oak Island-Caswell Beach. The only discussion of these environmental impacts occurs in the SMP (Appendix A, p. 11). Current plans indicate that approximately one million cubic yards of material would be available for beach disposal every two years. In years 2, 4,

and 8 this material would go on Bald Head Island; in year 6 sediment would go to Caswell Beach. The SMP notes that beach invertebrates may be smothered or displaced, but that recovery may occur after one year and notes that "... nearshore organisms would not be completely eliminated from the area as a result of the disposal operation." Furthermore, the EA contains no commitment to perform maintenance work during the colder period of lowest biological activity. The EA only notes (p. 34) that sand placements will be conducted during the winter months "... to the maximum extent practical. ..." The current EA contains no consideration of the gradual reduction in population levels that might occur over decades as the result of periodic, severe population decimations during years of beach disposal.

**Corps Response:** See response to your comment 13 above regarding monitoring. See paragraph 5.06 of the EA regarding impacts associated with maintenance disposal.

**FWS Comment 20** (page 8, Hardbottoms, paragraph 1): The EA states (p. 2) that the seaward extension of the existing channel would pass through a "substantial amount of live coral and other valuable hardbottoms", but later states (p. 36) that reef-forming coral "... are not known from the immediate project vicinity." Dredging to construct the new alignment is expected to have "no direct impacts on hardbottoms" (p. 33-34). However, the discussion of impacts to offshore hardbottoms (p. 27) does not address turbidity and siltation from dredging of the new channel, backfilling the old channel, and transporting overfilled dredges to area beaches. If live corals are adjacent to the old channel that would be abandoned, they may be destroyed by sediment disposal used to fill this channel. The Corps should provide more discussion of information used to assess the presence of and impact to corals as a result of the proposed project modifications.

**Corps Response:** The only hardbottom known in the project vicinity would be in the extension of the existing channel. One of the major reasons the alternative alignment is proposed is to avoid this hardbottom area. No hardbottom is known in or nearby the proposed project components. Therefore, sediment disposal or associated turbidity will not significantly affect hardbottom.

**FWS Comment 21** (page 8, paragraph 2): The EA does not adequately address project impacts on ecologically important hardbottom areas that may be near disposal beaches. Kure Beach's coquina outcrops are not listed in the hardbottoms discussion, and neither are the hardbottoms immediately offshore of Oak Island. The EA claims (p. 28) that all known hardbottoms off Brunswick County are seaward of the active littoral zone. However, the Service FWCA Report (pp. 11 - 12) discusses reports indicating that hardbottoms may be immediately offshore of the proposed disposal beaches of Oak Island. The discussion of impacts to hardbottoms (p. 27) does not address turbidity transporting overfilled dredges to the beach and the washing of fine-grained material off the beach onto hardbottoms immediately off of Oak Island.

**Corps Response:** Page 28 of the EA is correct, hardbottom off the beaches of Brunswick County are seaward of the littoral zone. Hardbottoms of the project vicinity are described on page 22, paragraph 3 of the EA, where it is noted that substantial amounts of low-relief hardbottoms occur off Brunswick County, generally more than one mile offshore. Recent bottom surveys show the presence of hardbottoms between Lockwoods Folly Inlet and the western limits of Jay Bird Shoal, including the area off Oak Island (Cleary, 1999). Rock comprising these hardbottoms is periodically exposed as the thin veneer of sediments in this area is reworked by storms and other natural processes. The amounts and locations of

exposed hardbottom off Brunswick County are continually changing as sediments are redistributed, alternately covering and uncovering the underlying low-relief rock.

**Corps** use of the term "littoral zone" in the context of coastal engineering is the nearshore zone where significant longshore transport of sand occurs in response to wave action. The performance of beachfill placement is evaluated on the basis of conditions in this zone. This zone along Brunswick County beaches extends seaward from the shoreline to about the 20-foot depth contour. Hardbottoms off Brunswick County are generally seaward of the 30-foot depth contour.

Localized, minor, short-term increases in turbidity could result from dredging of the new channel; backfilling the old channel; transporting overfilled barges, scows, and hoppers to the beach; and the washing of fine sediments off the beach. However, it is not expected that the magnitude or duration of these effects would have any significant impacts on hardbottoms, particularly since none are known to occur in the immediate vicinity of the proposed work.

**FWS Comment 22** (Page 8, Littoral Sand Movement): Another long-term impact not adequately addressed by the EA is changes to the local oceanfront erosion rates which could increase as sediment traveling alongshore sinks into the newer, deeper channel. While these impacts to the longshore sediment transport system are clearly significant, they were not discussed in the present EA (other than the SMP appendix) nor in the Final EIS of June 1996. The Sand Management Plan (SMP) provided in Appendix A of the EA describes how this will occur in the following sections:

(SMP, Section 18, p. 9) "The construction and maintenance of a deep ocean entrance channel through a tidal inlet will have the same impact on the movement of littoral sediment past the entrance as stabilizing structures such as jetties. However, the impacts of a dredge channel on the adjacent shorelines are generally more subtle than the impacts associated with stabilizing structures. In the case of stabilizing structures, there is usually a visible build-up of material adjacent to the updrift structure with corresponding erosion downdrift of the opposite structure. These impacts are normally clearly visible and measurable within distances of thousands of feet of the structures. Navigation projects that include stabilizing structures are generally formulated to include some means to bypass sand from one side of the entrance to the other in order to prevent project induced erosion on the adjacent beaches. Dredged channels, on the other hand, do not cause material to build-up on one side of the inlet or the other, rather, the impact of sediment removal from the dredged channel tends to be diffused throughout the impacted area. Since this diffusion process can extend over miles of shoreline, the erosive impact of the sediment removed from the navigation channel and its deposition outside the active littoral zone is difficult to detect in the short term since the magnitude of the impact may be of the same order as normal temporal fluctuations in the shoreline position. Also, where stabilizing structures generally have a well defined impact on the predominant downdrift beach, channel projects affect both sides as material is deposited in the navigation channel from both the updrift and downdrift beaches."

(SMP, Section 20, pp. 9-10) "Years of research by the U.S. Army Corps of Engineers and practical knowledge gained from the operation of the numerous coastal navigation projects around the country has resulted in the realization that littoral material must be conserved. Natural supplies from rivers and streams are not replenishing littoral sediments, particularly on the East Coast of the United States. Thus, the removal of a cubic yard of littoral sediment from a tidal entrance or inlet with deposition outside the active



littoral zone of the beach will ultimately cause a cubic yard deficit somewhere within the sand sharing system affected by that particular entrance or inlet. The impact of the removal of littoral sediment from the active littoral zone through channel maintenance is identified as a major cause of man-induced erosion in the U.S. Army Corps of Engineers Shore Protection Manual. From an engineering perspective, the primary requirement for the Wilmington Harbor maintenance program, apart from assuring that the channel remains open year-round, is to prevent project induced erosion of the adjacent beaches by conserving the limited natural resource, sand, through deposition directly on the adjacent beaches."

The EA fails to address the environmental impacts of increased erosion rates of adjacent beaches other than to state (p. 27) that the beach disposal "will result in enhancement of the regional sediment budget" and that "erosion rates on the adjacent beaches will be reduced compared to historic rates." These statements are not completely accurate. Moving sediment from one part of the littoral system to another (i.e., dredging from an inlet channel and disposal on adjacent beaches) does not produce a net increase in the regional sediment budget. Sediment placed in the ODMDS or disposal islands will actually decrease the regional sediment budget. Beach placement of dredge spoil will simply redistribute where the sediment is found in the system, not increase its volume. The second statement regarding erosion rates is valid in that the long-term erosion trend will have a glitch with the input of dredge spoil, but the position of the beach will be all that has changed. The actual contemporaneous rate at which the sediment erodes will be equal to or greater than current rates, as the Corps states repeatedly in the SMP.

The disruption of the natural littoral drift across the mouth of the Cape Fear River is a significant indirect environmental impact. A wave transformation analysis was conducted to determine whether the new channel alignment would change sediment transport at the mouth of the river. While the Corps reports (p. 27) that the project would not alter the "sand transport potential," this analysis has not been discussed in detail or in relation to the SMP statements given above regarding modifications to the longshore sediment transport system. Any alteration in erosion rates would create significant impacts over the project's life. Environmental impacts would also be significant in a cumulative sense when the present project is considered in the context of other North Carolina dredge and fill projects. Therefore, the Service requests that the next NEPA document provide a thorough assessment of indirect, long-term and cumulative environmental impacts associated with project-induced changes to the longshore sediment transport system and subsequent habitat loss.

Removing sediment from the nearshore littoral system (i.e., placement in disposal islands or the ODMDS) will increase the physical impacts to local beaches and fish and wildlife resources that inhabit them. Current project plans (Appendix A, p. 3) call for initial construction to remove at least 2.8 million cubic yards of non-beach quality material and place it in the ODMDS. Furthermore, material may be removed from the littoral system if small, "problem shoals" develop in the channel between maintenance events; this material would be moved by hopper dredge to the ODMDS (Appendix A, p. 12). While river borne sediment may eventually replace this material, full replacement may require many years during which impacts associated with this removal would persist. The impacts of removing sediment from the littoral system during both initial construction and subsequent maintenance have not been fully evaluated and the Service requests that the next NEPA document address the issue in a comprehensive manner.

**Corps Response:** Disagree that the impacts of the project on the adjacent beaches has not been adequately addressed in the EA since the Sand Management Plan appendix is part of the EA. With regard

to the impacts of the Wilmington Harbor 96 Act project, the sand management plan would result in changes from the existing disposal practice, which would result in an enhancement of the current littoral budget. Granted, new material would not be added to the system with the implementation of the sand management plan, however, compared to existing conditions, sand presently being lost through disposal in the ODMDS would be retained in the littoral system and therefore would constitute an improvement to the overall sediment budget of the region.

The Corps of Engineers modeled changes in sediment transport potential associated with the new ocean entrance channel and found no measurable change along adjacent beaches. Since this does not mean that changes will not occur, a detailed monitoring plan has been included in the sand management package to measure actual changes in the shoreline response following project construction. See paragraph 11.00 of this FONSI regarding monitoring and other environmental commitments. The observed behavior of the adjacent shorelines obtained through the monitoring program will be used to dictate where littoral material trapped by the entrance channel is to be placed. Through this process of observation and sediment disposal, the condition of the adjacent beaches will undoubtedly be improved over that which presently exists.

Anytime material is placed on a beach, the erosion rate of the placed material is expected to be greater than that which is occurring naturally. This is due to several reasons with the two most important being a change in the planform configuration of the beach and the addition of erodible material to the system. With regard to planform changes, the placement of material on the beach will create a protrusion in the shoreline relative to the natural shoreline. This protrusion will include transitions at the terminal ends of the fill, which will be subjected to higher rates of sand transport compared to the natural shoreline alignment. The rate of loss from the fill area will depend in large measure on the added width of the beach resulting from the placement and the length of the transition sections. For the disposal operations planned for Bald Head Island, east Oak Island-Caswell Beach, west Oak Island, and Holden Beach, increased beach widths will be in the range of 60 to 70 feet with transition sections of approximately 1,000 feet. The extent of the impact of the fills and losses from the fills on adjacent beaches will be minor based on actual observations from two long-standing beach nourishment projects in North Carolina, namely, the Wrightsville Beach and Carolina Beach projects which have been routinely nourished since 1965. The impact of these two beach projects (which had associated increases in beach width of around 150 to 200 feet) on the adjacent beaches was observed to be limited to approximately one-half mile from the ends of the fills.

Most of the beaches designated to receive some of the harbor material; particularly Oak Island, Caswell Beach, and Holden Beach; have been stripped of their surficial layer of littoral material exposing erosion resistant lagoonal marsh sediments, peat, and tree stumps. Accordingly, the sediment transport potential associated with the existing wave climate, particularly the transport potential during storm events, is not being satisfied due to the lack of erodible or transportable littoral sediment on the active beach. The placement of beach quality material on these beaches during initial construction of the Wilmington Harbor 96 Act project, along with the periodic placement of maintenance material will restore and maintain the relatively soft and erodible nature of the area beaches.

The extreme east end of Oak Island (which is owned by the North Carolina Baptist Assembly) and Bald Head Island are sand rich systems. Therefore, the existing wave climate is transporting material at its

maximum possible rate along these two beach segments. As no disposal is planned for the beach fronting North Carolina Baptist Assembly, placement of dredged material west of the entrance will begin approximately 1 mile from the entrance. Apart from minor changes in sediment transport rates off the end of the disposal area which will be limited in scope (see paragraph above), sand transport into the Wilmington Harbor Entrance channel from the west will not be affected. With regard to the Bald Head Island side, even though South Beach is eroding at an inordinate rate, there is still an adequate supply of littoral sediment on the island to satisfy the sediment transport potential of the natural wave climate. Since the transport potential of the waves is being satisfied, the placement of additional sediment on this beach will not appreciably affect sediment transport rates into the entrance channel. Note that three beach disposal or nourishment operations have occurred on Bald Head Island since 1991 with no measurable change in channel shoaling rates. In any event, with regard to the impact of the depositing the navigation material on the adjacent beaches, any change in sediment transport to the entrance would simply be removed and placed back on the adjacent beaches during subsequent maintenance operations. Therefore, any beach related impact associated with a presumed or actual increase in transport to the entrance resulting from the sand management plan would be offset through the periodic disposal of this same material on the adjacent beaches during routine channel maintenance.

**FWS Comment 23** (page 10, Cumulative Impacts Analysis): The consideration of cumulative impacts is totally inadequate. Section 5.14 of the EA simply chronicles (pp. 43-44) past harbor modifications, lists certain perceived benefits of the project, and concludes that "cumulative impacts of the proposed action appear negligible." This section makes no attempt to consider the adverse impacts of beach disposal on natural resources in the context of ongoing projects of a similar nature and similar projects that are planned for the future.

The lack of a complete cumulative impact analysis may be the result of a common misunderstanding of cumulative impacts as they are defined in the NEPA. As given in § 1508.7 Title 40 Code of Federal Regulations, a cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. A key phrase in this definition is "other projects." Cumulative impacts are not those associated with repetitive actions that may be a part of the project under consideration, but are associated with other projects in a defined area. The long-term impacts of repetitive actions would be secondary project impacts. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Cumulative impacts must be defined in the context of a given environmental component or resource, a specific geographic area, and a time frame.

The Service requests that the next NEPA document for this project contain a cumulative impacts analysis that places current beach disposal operations in the context of ongoing beach nourishment projects and projects which are now in various stages of planning. Resources to be included in a cumulative impact analysis should include populations of beach invertebrates, feeding and resting habitat for non-breeding (migratory and over-wintering) shorebirds, populations of marine benthic invertebrates, and habitat for nearshore fishes. The time frame for the analysis may be the standard 50-year period of federal beach nourishment projects.

The geographic area of this analysis should be, at a minimum, the area from Wrightsville Beach in the north along the coast to Sunset Beach near the South Carolina line. This area would require a consideration of the Brunswick County Beaches Nourishment project (for 2004-2005) which may occur only 2-3 years after beach disposal from this project is complete. The nearby federal nourishment projects at Wrightsville, Carolina and Kure Beaches and the proposed nourishment projects at Oak Island, Holden Beach, and Ocean Isle all create an environment of very few undisturbed beaches in Brunswick and New Hanover Counties (Figure Eight Island conducts private beach nourishment activities). Potential use of Jay Bird Shoals as a borrow area for the Oak Island and Holden Beach projects also needs to be included as requiring review in cumulative impact assessments. The use of this offshore borrow area should be analyzed in the context of other offshore borrow areas used for New Hanover County beaches and those under consideration for Ocean Isle Beach and Brunswick County beaches.

**Corps Response:** If all the existing and proposed beach disposal and beach nourishment projects in North Carolina were performed in one year, they would cover about 64.9 miles of the 320 miles (20.3%) of North Carolina shoreline. However, we would not receive funding to perform all these projects in any one year. The more likely or average scenario would be about 17.9 miles per year or about 5.6% of the coast. This would generally result in 3 to 4 years between disposal events on a particular stretch of beach. This disposal frequency should generally allow recovery of beach resources. Beach disposal does have environmental benefits such as restoring nesting habitat for sea turtles on highly eroded beaches. This is the case on most of the Brunswick County beaches where disposal is planned. In fact the major purpose of the Ecosystem Restoration Report, Section 1135, Sea Turtle Habitat Restoration, Long Beach North Carolina, (dated November 1998) project on Oak Island is restoration of turtle nesting habitat as is indicated by the title.

The potential impacts of all these projects are similar with a potential to disrupt life stages of several species including sea turtles, shorebirds, beach invertebrates and nearshore fishery resources. However, as indicated in the response to comment 12 above, there are some uncertainties about the impacts on beach nourishment. Due to the uncertainties of the potential impacts of disposal of sand on the beach year-round, some additional monitoring is justified. These uncertainties concern beach disposal impacts on sea turtles, larval and juvenile fishes, shorebirds, and surf zone invertebrates. The Corps will address these issues through the development of an integrated monitoring plan. This plan will be developed through coordination with all interested agencies or individuals, and it should be implemented by the fall of 2000. See paragraph 11.00 of this FONSI regarding monitoring and other environmental commitments.

The borrow area for the proposed project is the existing navigation channel, except for disposal island 3 and 4. The maintenance of the channel is not similar to an offshore borrow area in that the channel will be maintained whether the dredged material goes to the beach or to the ODMS. Evaluation of the cumulative impacts associated with offshore borrow areas will be performed in association with the individual projects that use such borrow sites.

**FWS Comment 24** (page 11, Determination of Significance of Environmental Impacts, paragraph 1): The EA ends (p. 59) with the statement that the proposed action is not expected to significantly affect the quality of the human environment. The Service strongly believes that such an expectation is totally premature. First, several project features that will ultimately influence the level of environmental impact

have yet to be finalized. While it is possible to speak of maximum sand quantities and a maximum beach length, the interplay of these two important factors has a critical role in project impacts. These factors should be firmly established before any determination of the significance of project impacts.

**Corps Response:** As indicated on page 59 of the EA, paragraph 9.0 was a Draft Finding of No Significant Impact. This paragraph also indicated that a FONSI would be signed if signing was confirmed to be the appropriate action through coordination of the EA. Based on this coordination, signing of the FONSI is the appropriate action.

**FWS Comment 25** (page 11, bottom paragraph and bullets at bottom of page and page 12): There are other project features for which a rough approximation of the nature and degree of environmental impacts should be made in further NEPA documentation. These project features, in no order of importance, are:

- Dredging a new navigation channel that will profoundly alter 438 acres of marine bottoms (while adverse impacts associated with the new alignment may be less than enlarging the old alignment, this does not mean that construction of the proposed channel will have an insignificant impact on the environment);
- Permanently altering the movement of sand within the longshore transport system (an impact not considered in the 1996 Final EIS) and henceforth requiring the Corps to move the naturally appropriate amount of sand, at the appropriate time, to the natural location in order to avoid excessive, project-induced beach recession;
- Removing at least 2.8 million cubic yards of material from the littoral system during initial project construction and the subsequent removal of lesser quantities during maintenance when it is acknowledged that each cubic yard removed from the littoral system will produce a deficit on one cubic yard elsewhere in the sand sharing system;
- Disposing of up to six million cubic yards of dredged material along beaches that may range from 7.8 to 14.7 miles;
- Disposing of dredging material during a single, continuous 18-month operation that will cause disruptions during one and perhaps a second period of maximum biological activity for shorebirds and beach invertebrates that form an important base to the coastal food chain;
- Conducting approximately 725 blasts on the bottom of the Cape Fear River which is important habitat and migratory pathway for many species of fish;
- Initiating a permanent program of beach disposal on two beaches (Bald Head Island and Caswell Beach) and perhaps a third (area south of Fort Fisher);
- Eliminating certain restrictions on dredging operations and sediment transport that are considered beneficial to water quality and aquatic organisms; and,
- Adding to the loss of natural, unaltered beaches in southeastern North Carolina through the cumulative impacts of the present project when viewed in the perspective of ongoing beach nourishment projects (Wrightsville, Carolina and Kure Beaches) and projects that are being planned (Ocean Isle Beach and Brunswick County Beaches).

**Corps Response:** All these issues have been adequately addressed in the EA or this FONSI.



**FWS Comment 26** (page 12, first paragraph following the bullets): At the present time it is the opinion of the Service that the aggregate environmental impacts of the project features listed above will be significant in the sense of the NEPA. We see no justification for a FONSI. The level of environmental impacts for those project features which are now reasonably well established and the greater level of analysis which we have requested in this letter clearly indicate that compliance with the NEPA requires the preparation of an EIS.

**Corps Response:** See Corps response to FWS comment 2 above.

**FWS Comment 27** (page 12, bottom 2 paragraph): An important point to consider is that well established mitigation measures are available to reduce the environmental impacts of the proposed measures. In many cases these mitigation measures can make the difference in whether a given project feature would have a significant or insignificant environmental impact. The Corps should not expect these mitigation measures to be cost neutral. The preservation of environmental quality usually comes at a price.

It would be possible for the Corps to make major reductions in the level of environmental impacts which are now likely to occur. Many of these measures were contained in the recommendations of our December 1999 Draft Supplemental FWCA Report. For instance, beach disposal could be scheduled for 3 winter periods and completely avoid the warmer periods of highest biological activity. While fish cannot be totally protected from the proposed blasts, the impacts could be mitigated as we suggest in recommendation 19. However, the Corps responded that "mitigation is not needed for the elimination of the bubble curtain." In recommendation 5, the Service noted that the abandoned channel could be used to mitigate the marine habitats lost along the new alignment. The Corps responded that such an effort would probably be impossible.

**Corps Response:** In paragraph 7.02 of the EA, we appropriately responded to all of the recommendations of the Draft Supplemental FWCA Report. In response to recommendation 5, we did not indicate that it would probably be impossible to use the abandoned channel to mitigate the marine habitats lost along the new alignment. What was indicated in response to comment 3 was that "... it would be impossible to reestablish substrate characteristics along the backfilled channel that are identical to those of the surrounding area..."

Also see Corps responses to FWS comments 12 and 15, above.

**FWS Comment 28** (page 13, paragraphs 2&3): The Service believes that the next NEPA document issued by the Corps must have all the characteristics, regardless of its official title, of an EIS. The Service suggests that the Corps consider issuing a revised EA that addresses the concerns we have discussed. This document would provide an opportunity to provide extensive mitigation measures to reduce the current level of environmental impacts. The revised EA must provide the same level of description and depth of analysis that would normally be presented in an EIS. The revised EA must not be combined with a FONSI, but should be released as a stand-alone document for general review. The critical point is not the title of the document but the adequacy of data presentation and analyses.

If the Corps chooses to retain all the project features presented in the EA, the Service has no choice but to recommend that an EIS be prepared. The scope and magnitude of environmental impacts



that are almost certain to occur are simply inconsistent with a FONSI. It would be most unfortunate if the direct, indirect, and cumulative effects associated with the proposed modifications became an accepted standard for insignificant impacts on the environment. In order to maintain the environmental protection that the NEPA provides the Service can not support the current Corps' initial finding that the proposed actions would not significantly alter the quality of the human environment.

**Corps Response:** See response to comment 2 above.

**5.06 Supplement to the Final Fish & Wildlife Coordination Act Report April 2000.** This report was received April 28, 2000. The recommendations in this report are similar to those in the draft supplement included in appendix G of the February 2000 EA. The FWS recommendations and Corps responses are indicated below. Changes to the recommendations and responses since the draft report are indicated in **bold**. Recommendations in both the draft and final FWS reports have been considered during project development and refinement.

**1. FWS Recommendation:** A Tier One Assessment according to the Inland Testing Manual (ITM) adopted by the Corps and the EPA in 1998 be conducted on all sediments in the project, and such documentation be included in the environmental documents. Sediments to be assessed include those from any disposal islands proposed for pumpout for either beach or offshore disposal. Should any sediments contain contaminants or toxins that exceed EPA standards, appropriate measures should be taken to manage the contaminants.

**Corps Response.** The Tier 1 evaluation specified by the Inland Testing Manual (EPA 1998) is essentially the same as the Tier 1 evaluation under the Ocean Disposal Manual (Green Book, EPA 1991). A Tier 1 evaluation under the Green Book has been performed for the entire harbor from the Anchorage Basin downstream. All these sediments were found acceptable for ocean disposal (Corps 2000).

**In addition, a Tier 1 under the Inland Testing Manual must comply with 40 CFR 230.60 (a), (b), (c), and (d). The 404b evaluation included in appendix D of the EA satisfies these requirements.**

**2. FWS Recommendation:** The Corps should address the issue of existing and proposed Essential Fish Habitats (EFH) in the new channel alignment and immediate surrounding areas. If any existing or proposed EFH are located in the new alignment construction area or offshore disposal areas, the Corps should coordinate with the NMFS to take the appropriate conservation measures.

**Corps Response.** Essential Fish Habitat (EFH) is described in the EA in Paragraph 4.05 and potential project impacts on EFH are discussed in Paragraph 5.05 of the EA. No significant impacts on EFH or EFH species are expected to result from the proposed action. This information has been coordinated with the NMFS. **In addition, NMFS comments on the EA regarding EFH have been addressed in paragraph 5.1-5.3 of the FONSI.**

**3. FWS Recommendation:** Loss of benthic habitat with the creation of a new channel should be mitigated in-kind with backfilling the abandoned channel with identical or very similar substrate grain size, composition and geomorphology as adjacent benthic substrates.

**Corps Response.** Benthic resources and habitats of the project vicinity are described in Paragraph 4.04 of the EA, and potential impacts are addressed in Paragraph 5.04 of the EA. Although benthic habitat along the new channel alignment will be destroyed within its area of new impact and the inhabitants of this area will be lost, a larger area of benthic habitat will result from backfilling approximately 3.3 miles of the abandoned channel. However, it would be impossible to reestablish substrate characteristics along the backfilled channel that are identical to those of the surrounding area, given the practical constraints associated with contract dredging operations and the existing variable grain size distribution of sediments to be derived from harbor deepening. Planned backfilling of the channel would maximize the utilization of sediment that has high sand content but that does not meet the required 90% minimum for beach placement. After completion of backfilling, the surface of the abandoned channel is expected to be similar to the surrounding bathymetry.

**4. FWS Recommendation:** The 2500' designated buffer surrounding the channel where it passes through the existing ODMDS should be regularly surveyed for bathymetric changes in order to monitor increased shoaling rates of the channel, which would lead to increased maintenance needs. Additional surveys should be conducted along a similar 2500' corridor for the entire new channel alignment, seaward of station 50+00, in order to monitor for shoaling from other adjacent sediment bodies. Multi-beam **or the Corps SHOALS surveys** would yield more accurate bathymetry data than a few scattered soundings and increase spatial resolution and coverage.

**Corps Response.** Routine bathymetric surveys are conducted periodically along all Wilmington Harbor channels to monitor deviations from authorized project depths. Encroaching shoals are then removed by maintenance dredging. Bathymetric changes that may occur outside authorized Federal navigation channels are not a concern of our maintenance dredging program and, therefore, are not monitored.

**5. FWS Recommendation:** Sediments used to backfill the abandoned navigational channel should match the native grain size, mineral composition and organic content in order to better mimic the native habitat.

**Corps Response.** We agree with this concept but do not believe it is a fully achievable goal. See responses to USFWS Recommendation 3 above and Recommendation 6 below.

**6. FWS Recommendation:** Backfilling of the abandoned channel should approximate the natural bathymetric contours and geomorphology of the surrounding areas. Deviation from the natural conditions could prevent or delay re-colonization of the newly filled area by benthic organisms.

**Corps Response.** See response to USFWS Recommendations 3 and 5 above. In addition, it is generally recognized that substrate characteristics may influence benthic communities in various ways and that benthic communities inhabiting different substrates typically vary in a number of characteristics, including species composition, species diversity, total biomass, and population numbers. Benthic organisms in this area of the nearshore ocean have been reported at densities ranging from about 90 individuals per square meter on sand bottom to over 500 per square meter on mud substrate (Birkhead et al., 1979). However, later benthic studies conducted in the vicinity of the ODMDS found no correspondence between habitat type and species abundance, and no relationship between previous

disposal of dredged material and either infaunal assemblage or abundance/diversity (USEPA, 1993). From this information, one could conclude that backfilling the abandoned channel with available dredged material may result in changes in benthic community structure that are so small as to be insignificant, or that if the average grain size of backfill sediments is finer, that larger numbers of individuals may populate the area. In either case, no significant impacts on benthic resources or benthic habitat are expected to result from the proposed action.

7. **FWS Recommendation:** The backfilled channel should be monitored regularly with both bathymetric surveys (**preferably multi-beam or SHOALS**) and benthic organism surveys to establish recolonization rates and success or failure. Bathymetric surveys would generate data on changes to the former channel due to altered current or wave patterns, which could suspend portions of the fill and remove it from the channel. Any measured impacts over the life of the project should be mitigated through coordination with the Service, NMFS and other relevant agencies.

**Corps Response.** Bathymetric surveys will be conducted at least annually along the abandoned channel in order to document the progress and ultimate completion of the backfilling activity.

Surveys of benthic organisms are not proposed since the backfilled channel will repopulate with benthos from surrounding areas. The actual rate of recolonization and the future characteristics of community structure, if known, are not expected to lead to identifiable management decisions or additional Federal actions since changes can not be judged adverse merely because they occur. For example, fishes that consume benthic organisms tend to be opportunistic feeders, and are not generally dependent upon the presence of specific benthic species as critical food sources. Therefore, changes in benthic community structure would not necessarily translate into specific impacts through the food chain.

8. **FWS Recommendation:** No disposal of dredge materials should take place on beaches or the littoral zone during the sea turtle nesting and incubation season of May 1 to November 15, which roughly coincides with shorebird nesting and beach invertebrate spawning and recruitment seasons.

**Corps Response.** Disposal of maintenance dredged material on the beaches or the littoral zone will comply with this time period to the maximum extent feasible. However, due to the large volume of dredged material during construction and the cost and time savings of one continuous construction period, placement of sand on the beaches is scheduled to begin December 2000 and continue for about 18 months (see Paragraph 1.04 of the EA).

9. **FWS Recommendation:** Fill placement should not create a pronounced hill or mound of sand that could create an obstacle or scarp to wildlife and human resources utilizing the beach.

**Corps Response.** Beach fill will be shaped immediately after placement to achieve a gradual slope and will be periodically monitored for scarp formation. Scarps will be leveled, as necessary, to comply with requirements of Section 7 of the Endangered Species Act. **See paragraph 11.00 of this FONSI regarding monitoring and other environmental commitments.**

10. **FWS Recommendation:** Heavy equipment used to manipulate fill sediments placed on the beach should be kept to a minimum, perhaps only one regular size bulldozer on any given beach at any

given time. Night work should use the minimum amount of light necessary (which may require shielding) or low pressure sodium lighting during project construction. **Extensive lengths of pipeline should not be stored on or run along the beach, but placed behind the primary dune or dune scarp with perpendicular sections crossing to the beach as close to the immediate disposal area as possible. Heavy equipment (e.g., contractor sheds, trucks, bulldozers, extra pipeline, surveying equipment) should not be stored on the beach at night during the sea turtle nesting and hatching season.**

**Corps Response.** Usage of heavy equipment on beaches will be minimized to the extent consistent with work requirements. Lighting for night work must comply with safety requirements and not impede work progress, but will be minimized to the extent practicable. **Pipeline and other equipment will be placed so as to minimize impacts on sea turtle nesting and hatching.**

**11. FWS Recommendation:** Sediments disposed on the beaches or adjacent littoral zones should be *at least* 90% sand, match native grain size ranges and mineral composition, contain as little organic matter as possible and be free of contaminants exceeding safe levels. **Monitoring and sampling should be conducted daily of the dredge spoil material placed the day before on all project beaches for grain size distribution and total organic content (TOC) in order to ensure only beach suitable material is disposed of on the beaches. TOC levels should be measured for each mile of beach within two months prior to dredge spoil disposal for comparison purposes. Reports summarizing the sampling should be provided to the Service on a weekly basis throughout the beach disposal period, and the Service shall be notified within 48 hours of the discharge of any dredge spoil that is not beach suitable (i.e., less than 90% sand size sediments).**

**Corps Response.** See the Sand Management Plan in Appendix A of the EA. The sediments to be placed on the beaches or in the littoral zone will **average at least 90 percent sand, contain little organic matter, and be free of contaminants exceeding safe levels. Borings will be taken on the beach following completion of disposal to confirm the type of material in place. During construction if it appears that non-beach suitable material is being placed on the beach, appropriate samples will be collected and corrective action taken if needed.**

**12. FWS Recommendation:** Beach fill should be monitored for compaction, escarpment formation, and subaerial and subaqueous profiles on a regular basis (perhaps quarterly and after every storm) in order to determine the longevity of the material's placement. Immediately after completion of sand disposal on beaches and prior to sea turtle nesting seasons, monitoring shall be conducted to determine if escarpments are present and escarpments shall be leveled as required to reduce the likelihood of impacting sea turtle nesting and hatching activities.

**Corps Response.** After placement of dredged material on the beaches and prior to the first turtle nesting season, the beaches will be monitored for compaction. The beach will be monitored for escarpment formation prior to each nesting season. If the beach hardness exceeds 500 cone penetrometer units, the beach will be tilled. If an escarpment exceeds 18 inches, then it will be leveled. See paragraph 11.00 of this FONSI regarding monitoring and other environmental commitments.

***\*\*\*FWS Recommendations 13 and 14 were not included in the draft supplement. Therefore the numbering sequence of comments 13 through 21 in the draft has been increased from 15 through 23 in the final supplement.\*\*\****

**13. FWS Recommendation:** Nearshore turbidity levels should be measured with a Turbidimeter on a daily basis during beach disposal work, with direct sampling of both the nearshore turbidity plume and adjacent ambient waters within 250 feet of the discharge pipe. Turbidity levels should not exceed the state saltwater standard of 25 NTUs or naturally elevated ambient conditions. A weekly report should be submitted to the Service and other relevant government agencies of measured turbidity levels, and a review should be conducted at 3 months on sampling protocols.

**Corps Response.** Due to the uncertainties of the potential impacts of disposal of sand on the beach year-round, some additional monitoring is justified. These uncertainties concern beach disposal impacts on sea turtles, larval and juvenile fishes, shorebirds, and surf zone invertebrates. The CORPS will address these issues through the development of an integrated monitoring plan. This plan will be developed through coordination with all interested agencies or individuals, and it should be implemented by the fall of 2000. See paragraph 11.00 of this FONSI regarding monitoring and other environmental commitments.

**14. FWS Recommendation:** If the Corps chooses to proceed with beach disposal during the summer months, the next NEPA document should outline in detail how the proposed delineation of reaches of beach with less than ideal sea turtle habitat will occur, what data will be incorporated into such delineations, and the order of spoil disposals in such reaches. Prior to the actual time of disposal, Corps staff should meet with relevant Service and NCWRC staff on-site with relevant maps to review those reaches where impacts to nesting sea turtles may be minimized so that high density nesting reaches are avoided during the nesting season. Data from the 2000 nesting season, with new locational data from Global Positioning System (GPS) coordinates, should be incorporated into any delineations as it will further aid demarcation of areas where adverse impacts of summer disposal may be minimized.

**Corps Response.** This FONSI is the next and final NEPA document for the proposed action. The CORPS will address this sea turtle habitat concern through the development of a monitoring plan aimed at identification and quantification of beach disposal impacts on turtle resources. It is anticipated that this plan will be developed through coordination with FWS and other interested agencies or individuals and that it will be implemented in the fall of 2000. See paragraph 11.00 of this FONSI regarding monitoring and other environmental commitments.

**15. FWS Recommendation:** Beaches scheduled to receive maintenance materials (i.e., Bald Head Island and Caswell Beach) should be monitored long-term for increased erosion rates, decreased biological productivity and cumulative impacts to fish and wildlife resources, especially Federally-listed species such as sea turtles, piping plovers, and seabeach amaranth. Monitoring plans should be developed in coordination with the Service, NMFS and North Carolina Wildlife Resources Commission (NCWRC). Any measured impacts over the life span of the project and its maintenance should be mitigated through coordination with the Service, NMFS and other relevant agencies.

**Corps Response.** Dredged material is being placed on the beach because it is the least cost alternative, reduces erosion impacts, and has minimal long-term environmental impacts (see Paragraphs 5.04 and 5.08 of the EA). In addition, it is the policy of the North Carolina Division of Coastal Management that "beach quality material dredged from navigation channels within active nearshore, beach, or inlet shoal system must not be removed permanently from the active nearshore, beach or inlet shoal system unless no practicable alternative exists."(T15A:07M.1102(a)). See Appendix E of the EA for the biological assessment of listed species. All the impacted beaches are monitored annually for sea turtles, piping plover, and seabeach amaranth. Due to the severely eroded nature of area beaches, beach nourishment should actually improve habitat for sea turtles and seabeach amaranth. Attempted nesting by piping plovers has not been observed in recent years at Bald Head Island or Caswell Beaches, but dredged material will not be placed in active inlet areas where they normally nest. Maintenance material will be placed on the beaches during the least active biological period to the extent feasible.

**See responses to FWS recommendations 13 and 14 above. The Corps will address the need to supplement these existing monitoring activities through coordination with FWS and other interested agencies or individuals. Any additional monitoring will be implemented in the Fall of 2000.**

**16. FWS Recommendation:** Hopper dredges should not be used during the summer sea turtle nesting season or spring and fall migration periods when species numbers in inland waters are high.

**Corps Response.** The impacts of hopper dredging are discussed in Paragraphs 5.04 and 5.06 of the EA, and in paragraphs 4.02.5 and 4.02.6 of the Biological Assessment in Appendix E of the EA.

**17. FWS Recommendation:** Observers should be present on all hopper dredges to monitor for incidental takes of sea turtles year-round. All takes should be documented and reported to the Service and NMFS, and appropriate conservation measures coordinated in the event of excess takes.

**Corps Response.** Sea turtle monitoring on hopper dredges will be in accordance with the NMFS August 2000 Biological Opinion issued for this project.

**18. FWS Recommendation:** Dredging activities should not occur adjacent to disposal islands during the colonial waterbird nesting season of April 1 to October 31 in order to minimize disturbance to such nests. Activities should be minimized from disturbing colonial waterbirds with potential noise, lights and fumes at all times of the year. Potential screening/blocking or other appropriate conservation measures should be coordinated with the North Carolina Colonial Waterbird Management Committee and other relevant agencies.

**Corps Response.** The only disposal islands involved in the proposed action are Eagle Island across from the State Port in Wilmington and Disposal Islands # 3 and # 4 in the lower harbor. Eagle Island has had no known nesting by colonial waterbirds. Disposal Islands # 3 and # 4 have not had any nesting by colonial waterbirds since 1983, probably due to their height (over 25 feet) and size (about 30 acres each). The height has increased the effects of wind blown sand, which destroys nests, and the islands' size enables predators to survive year-round. However, prior to any dredging or disposal actions



that may affect Disposal Islands # 3 and # 4 during the nest season, the area will be surveyed for colonial waterbirds. If nesting is present, action will be delayed until nesting activities are complete.

19. **FWS Recommendation:** Spoil islands should not be pumped out or re-filled during the colonial waterbird nesting season to minimize disturbances to nesting habitat and existing nests. Surveys for nesting activities of least terns and other birds should be conducted to prevent such disturbances.

**Corps Response.** See response to Recommendation 18 above.

20. **FWS Recommendation:** All dredging activities should comply with existing agreements with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service as to timing and types of allowable dredges. The 1995 Biological Opinion and Incidental Take Statement issued by NMFS to the Corps (and any updates) should be fully complied with in particular.

**Corps Response.** The biological opinion and incidental take statement for hopper dredging for the project was issued by NMFS August 2000. We will comply with all aspects of the incidental take statement. Regarding timing and types of allowable dredges, we will comply with all conditions indicated in the EA.

21. **FWS Recommendation:** The Service recommends mitigation for the loss of fish (including sturgeon) associated with the blasting of rock during the project. The Service proposes the Corps either provide structural fish passage at Lock and Dams 1, 2 and 3 in addition to the fish locking sequence that is currently employed for anadromous fish and fund a graduate student (Master of Science) to examine the effectiveness of the structures, or remove these structures. The blast-induced fish mortality should be treated as a fish kill with known cause; dead and dying fish should be collected, counted, measured (length) and identified to species so that appropriate mitigation and restoration can be calculated. Small fish that may be quickly ingested by predators should have their size and numbers estimated.

**Corps Response.** As indicated in Appendix B of the EA, mitigation for the loss of fisheries habitat was discussed in detail in the EISs related to the Wilmington Harbor project (Corps 1990, 1994a & b, 1996a & b) and in the Final Mitigation Plan for the project (Corps 1999b). This included consideration of loss of bottom habitat where blasting would occur. No mitigation was proposed for the act of blasting because blasting in and of itself will not result in a permanent additional loss of habitat. Blasting will impact organisms in the water column near each blast during the short time each blast occurs (1.25 seconds = 25 msec between holes x 50 holes per blast). Impacts of each blast were minimized to the extent feasible by using air curtains, a delay after each hole, stemming, and blasting only during the NC Division of Marine Fisheries dredging window (1 August through 31 January). The only difference proposed now is the elimination of air curtains because they were not effective in reducing blasting impacts. Also, the EIS model overestimated the impact area by about 94 percent compared to the impact area indicated in the test blast project for blasts without an air curtain. In addition, the acres of rock blasting and number of blasts will be about 47 and 22 percent less, respectively, than indicated in the EISs. Therefore, mitigation is not needed for elimination of the air curtain.

Appendix E (at paragraph 4.02.6(b)) of the EA indicates that recent changes have been made in the operation of the locks and dams on the Cape Fear River to enhance the passage of anadromous fish. However, the Wilmington District Corps of Engineers and the Wilmington Harbor Project Sponsor, State of North Carolina, have agreed to construct a fish passage structure at Lock and Dam 1 on the Cape Fear River. This is the most downstream structure blocking fish passage on the river, and successful passage of fish over Lock and Dam 1 will open up about 32 miles of the main stem of the Cape Fear River to anadromous and other fishes. Additional investigations are required to determine the final design, but construction will probably consist of a rock rubble structure or similar feature. See paragraph 11.00 of this FONSI regarding monitoring and other environmental commitments.

The channel net set downstream of each blast should provide an estimate of what is killed or injured and remains near the bottom. During the test blasting an attempt was made to recover some of the fish observed at the surface. There were two problems with this. First, we have to wait for an all clear (all charges detonated) before we can approach the blast area. Generally a minute or so passes before the all clear is given. Second, by that time the dead and injured fish have washed downcurrent of the blast and the birds are consuming the fish. Generally after 5-10 minutes, fish were no longer available at the surface. Of the dead and injured fish observed during the test blasting, most of them were anchovies 3 inches or less in length, and the rest of the fish were generally less than 2 inches long. There was no direct loss of a recreational or sport fishery since we did not observe any dead or injured fish larger than 6 inches. Therefore, an attempt to collect fish at the surface would provide little if any meaningful results.

22. **FWS Recommendation:** All blasting should avoid times of spawning or known important juvenile stages of fish in the project area.

**Corps Response.** As indicated in paragraph 1.04.6 of the EA, blasting will be restricted to the NC Division of Marine Fisheries dredging window of August 1 to January 31.

23. **FWS Recommendation:** The Corps should provide contractual opportunities to local universities to conduct aquatic resource surveys before, during and after the project construction period in order to document and gather important data on valuable fish and wildlife resources such as the shortnose sturgeon and impacts to their populations and distributions. This data should be made available to the Service, NMFS and all interested parties.

**Corps Response.** Environmental studies will be conducted if and when specific needs are identified. The Corps obtains services for needed investigations through procedures specified in the Federal Acquisition Regulation (FAR) at Title 48 of the Code of Federal Regulations. These procedures emphasize open competition and, in the past, have permitted our utilization of commercial contractors and university personnel. For the Wilmington Harbor project, the Wilmington District has an ongoing contract for long-term monitoring of potential hydrologic and salinity changes associated with harbor improvements. This contract effort is being conducted by a commercial contractor with sub-contractual arrangements with faculty members at UNCW. Scientific data produced by the Corps is public domain and available to all.

## **6.00 NORTH CAROLINA STATE AGENCIES**

### **6.01 North Carolina Ports, letter dated March 6, 2000**

**NCP Comment:** I am writing in support of the Environmental Assessment and Finding of No Significant Impact for the pre construction modifications to the Wilmington Harbor Project.

The project to deepen the Cape Fear River navigation channel from 38 feet to 42 feet is a win-win situation for all North Carolina citizens, not only in terms of enhancing the statewide economic impact of the Ports Authority's activities, but for preserving and protecting our fragile coastline.

The significance of the environmental work is clearly illustrated by its placement at the beginning of the deepening project. Firstly, the new alignment of the ocean bar entrance at the mouth of the Cape Fear provides multiple benefits. It avoids the use of blasting and rock disposal which would have been required to deepen the ocean bar on its current alignment. The creation of a new entrance channel also avoids disturbing live coral bottoms which would be impacted by deepening the existing entrance channel.

Additional environmental positives will be realized at the site of the existing ocean bar entrance when it no longer is used as a shipping channel. It can then be backfilled with non-beach quality material from the deepening and maintenance of the inner harbor reaches. This environment will allow for the recruitment of benthic life forms and will reestablish fishing and shrimping grounds for reclamation by local commercial fishermen and shrimpers.

Moving the ocean bar entrance also lowers the total project cost by millions of dollars and critically keeps the project on schedule.

Another absolutely key element of the Wilmington Harbor Project is renourishment of Brunswick and New Hanover County shoreline with beach quality sand taken from the river bottom. Plans call for some 6 million cubic yards of sand to be placed on area beaches in the construction phase of the project with additional sand made available through the beach communities during the regular annual maintenance program for the foreseeable future.

In addition to these significant environmental benefits, North Carolina's Ports also provide substantial statewide economic benefits. The Wilmington Harbor Project's navigation benefits are absolutely essential to the future of the Port of Wilmington to keep current business, let alone attract new customers.

North Carolina's Ports serve as gateways to the global marketplace for our State's importers and exporters. Cargo handling activities at the Ports of Wilmington and Morehead City statewide account for over 80,000 jobs and nearly \$300 million in tax revenues. As one example, the 42-foot channel to the Port of Wilmington will allow a 900-foot container ship to realize up to \$12 million worth of additional cargo per port call, thereby allowing North Carolina's business and industry to expand manufacturing for export markets, creating more jobs and economic benefits throughout the state.

North Carolina will realize benefits from the navigation improvements to the Cape Fear River well into the future with additional jobs, income, sales and tax revenues, not to mention a sharper competitive edge for the State's business and industry.

I concur that this project will not significantly affect the quality of the human environment, but will, in fact, contribute significant enhancements. Accordingly, I support a Finding of No Significant Impact for the Wilmington Harbor Project.

**Corps Response:** Agreed, however based on additional investigations, the total estimated volume of sand to be placed on area beaches associated with construction of the project is 5.6 million cubic yards on Brunswick County beaches and 1.9 million cubic yards on New Hanover County beaches.

**6.02 North Carolina Department of Environment and Natural Resources, letter dated March 30, 2000**

**DENR Comment:** The Department of Environment and Natural Resources has reviewed the proposed Preconstruction and Modifications of Authorized Improvements to the Wilmington Harbor Environmental Assessment. As a result of the review, our divisions found that the application did not contain enough environmental specification to allow complete evaluation.

Departmental divisions have put emphasis on possible cumulative impacts, wetland impacts, as well as, impacts to SAV and PNAs that may result from channel dredging. Another concern is the disposal of sand on sea turtle nesting beaches and in general the effects of blasting on all habitat within this area.

Considering the fact that the assessment has not yet developed into a decision making document, it is felt that the applicant would benefit more by amending the Environmental Assessment. The department encourages the Corps of Engineers to directly notify our commenting divisions so questions are satisfactorily resolved. Specifically addressing our concerns in a revised Environmental Assessment yields the best opportunity for this department to avoid delays during the permit processing stage.

**Corps Response:** The questions raised by the agencies in the Department are adequately addressed in this FONSI. Therefore a revised or amended environmental assessment is not needed. In preparing this FONSI, we did contact the commenting divisions in order to satisfactorily resolve their questions. Our responses to the questions follow each of their letters.

**6.03 Division of Coastal Management, form letter dated February 28, 2000**

**DCM Comment:** This is a form letter indicating that the project review number is DCM00-14 and that all comments received by the clearinghouse are needed to develop the State's consistency position. Also it is indicated that DCM will attend a March 1, 2000 interagency meeting to discuss the EA.

**Corps Response:** Noted.

**6.04 North Carolina Department of Cultural Resources, form letter dated March 3, 2000**

**DCR Comment:** The Department had no comments on the EA.

**Corps Response:** Noted.

**6.05 Division of Water Quality, letter dated March 13, 2000**

**\*\*\*By letter dated April 10, 2000, DWQ modified Water Quality Certificate Number 3085 to include the plans as outlined in the February 2000 EA.\*\*\***

**DWQ Comment 1** (paragraph 1): Wetland impacts have been proposed as part of this project associated with access channel dredging and the placement of dredge pipeline routes. All wetland impacts should be minimized to the greatest extent possible. Prior to the approval of a 401 Water Quality Certification, these impacts will have to be quantified and appropriate mitigation activities planned and approved by NC Division of Water Quality staff. If dredge pipelines must unavoidably cross wetland areas, measures to prevent leakage must be employed and the site(s) must be returned to original conditions after pipeline removal.

**Corps Response:** The only potential vegetated wetland impacts associated with the EA are the access channels to islands 3 and 4 and pipeline routes to the beaches that may potentially cross vegetated wetlands. These impacts are adequately addressed in paragraph 5.07 of the EA.

**DWQ Comment 2** (paragraph 2): In addition to wetlands, impacts to SAV, PNAs, and natural shellfish beds from access channel dredging and the placement of dredge pipeline routes should also be minimized to the greatest extent possible. If dredge pipelines must unavoidably cross these areas, measures to prevent leakage must be employed and the site(s) must be returned to original conditions after pipeline removal.

**Corps Response:** See response to comment 1 above. In addition, aquatic beds (including SAV) are addressed on page 35 of the EA, and PNAs are addressed on page 37, and neither should experience significant adverse effects.

**DWQ Comment 3** (paragraph 3): Provisions for overflow dredging adjacent to PNAs and contiguous to PNAs as listed in Paragraph 5.02 of the EA and in the Overflow Monitoring Plan should be strictly enforced to ensure, the protection of water quality in these sensitive areas.

**Corps Response:** Agreed. See paragraph 11.00 of this FONSI regarding monitoring and other environmental commitments.

**DWQ Comment 4** (paragraph 4): The EA states that the loss of benthic habitat that is proposed by this project will be offset by the backfilling of the existing, abandoned channel. To the extent possible, the abandoned channel should be backfilled with substrate very similar to adjacent benthic substrates. This will allow for the successful recolonization of benthic organisms in this area. This area should also be monitored long-term to evaluate mitigation success.

**Corps Response:** The impacts related to backfilling the abandoned channel are discussed in paragraph 5.04 (page 32) and in response 7 to the Fish and Wildlife Service recommendations on page 50 of the EA. The backfill material will be as similar as feasible to surrounding substrate. However as indicated in the EA, monitoring of benthic organisms is not proposed since the backfilled channel will repopulate with benthos from surrounding areas. The actual rate of recolonization and the future characteristics of community structure are not expected to lead to identifiable management decisions or additional Federal actions since changes can not be judged adverse merely because they occur. For example, fishes that consume benthic organisms tend to be opportunistic feeders, and are not generally dependent upon the presence of specific benthic species as critical food sources. Therefore, changes in benthic community structure would not necessarily translate into specific impacts through the food chain.

**6.06 Division of Water Quality, letter dated March 17, 2000**

**\*\*\*By letter dated April 10, 2000, DWQ modified Water Quality Certificate Number 3085 to include the plans as outlined in the February 2000 EA.\*\*\***

**DWQ Comment 1** (second unnumbered paragraph): This document was reviewed by staff in the wetlands unit and planning branch of the Division for consistency with the State Environmental Protection Act. The full comments are attached to this letter, but in summary, these issues must be addressed in an amended document before the Division can allow the Environmental Assessment document to proceed to the State Clearinghouse for public review.

**Corps Response:** An amended EA is not required since the FONSI adequately responds to all the comments received.

**DWQ Comment 2** (paragraphs 1-4): Please state the measures to avoid and prevent leakage associated with the project where dredge pipelines will cross wetland areas, and document the plans to return wetland areas to original conditions prior to completion of project activities.

Please state the measures to avoid and prevent leakage associated with the project where dredge pipelines will cross submerged aquatic vegetation, public nursery areas (PNA), or natural shellfish beds, and document the plans to return wetland areas to original conditions after project activities are completed.

Provisions for overflow dredging adjacent to PNA and contiguous to PNA as listed in Paragraph 5.02 of the EA and in the Overflow Monitoring Plan should be strictly enforced to ensure the protection of water quality in these sensitive areas.

Long-term monitoring of the area to be back filled with substrate should be included as part of the project life cycle, and substrate material very similar to the benthic area to be dredged should be used in this back filling component of the project.

**Corps Response:** All our contract plans and specifications for work that involves pipeline dredging has a requirement that all pipelines must be kept in good condition at all times and any leaks or



breaks along their length must be promptly and properly repaired. In addition, see the responses in paragraph 6.05 above.

**6.07 Department of Environment and Natural Resources, Interagency Review form dated March 13, 2000**

**DENR Comment** Any open burning must be in accordance 15 A NCAC 2D.1900, the Sedimentation Pollution Control Act of 1973 must be properly addressed for any land disturbing activity, and a 401 Water Quality Certification is required.

**Corps Response:** We will comply with these requirements if they apply to any aspect of this project. An erosion and sedimentation control plan is not required for the beach disposal aspects of the project, but would be required for actions such as work at islands 3 & 4. See paragraph 6.05 above regarding the 401 Water Quality Certification.

**6.08 Department of Commerce, letter dated March 16, 2000**

**DC Comment:** As Secretary of Commerce, I can attest to the important role that the Port of Wilmington plays in economic development for the state of North Carolina. The Port serves as a gateway to global markets for North Carolina's business, industry and consumers. The deepening of the Cape Fear navigation channel from 38 feet to 42 feet would allow the Port to keep current customers and to be competitive in attracting new business. This could mean more jobs and tax revenues for our citizens.

Therefore, I would like to offer my support for the U.S. Army Corps of Engineers' Finding of No Significant Impact for the draft Environmental Assessment. The Wilmington Harbor Project has the potential to yield both economic and environmental benefits for North Carolina. It is my hope that this project will move forward.

**Corps Response:** Noted.

**6.09 Wildlife Resources Commission, letter dated March 29, 2000**

**WRC Comment 1** (General Comments, last paragraph on page 1): The EA fails to address the cumulative impacts of this project with other beach disposal projects that are either on-going (Kure Beach, Carolina Beach, Wrightsville Beach and Masonboro Island) or still in the planning stages (Ocean Isle Beach, Holden Beach, Oak Island, Figure Eight Island, Onslow Beach, Bogue Banks and Dare County). Combined, these projects cover over 80 miles of coastline. This could have significant impacts on fish and wildlife resources, particularly if they are carried out within a few years of one another.

**Corps Response:** The specific issues related to cumulative impacts will be addressed in response to the specific comments that follow. Much of the proposed project is a one time disposal event on the Brunswick County Beaches with maintenance then occurring on a 2 year frequency but probably only a particular section of beach would receive maintenance dredge material every six years. See paragraph 5.06 of the EA. There is a study being performed for a potential beach nourishment project for the Brunswick County Beaches. However, that project is not dependent on the disposal actions described

in the EA. Whether or not that project is authorized and constructed will be based on its own merits and will not be based on what is being proposed under the EA.

If all the existing and proposed beach disposal and beach nourishment projects in North Carolina were performed in one year, they would cover about 64.9 miles of the 320 miles (20.3%) of North Carolina shoreline. However, we would not receive funding to perform all these projects in any one year. The more likely or average scenario would be about 17.9 miles per year or about 5.6% of the coast. This would generally result in 3 to 4 years between disposal events on a particular stretch of beach. This disposal frequency should allow recovery of beach resources. Beach disposal does have environmental benefits such as restoring nesting habitat for sea turtles on highly eroded beaches. This is the case on most of the Brunswick County beaches where disposal is planned. In fact the major purpose of the Ecosystem Restoration Report, Section 1135, Sea Turtle Habitat Restoration, Long Beach, North Carolina, November 1998 is restoration of turtle nesting habitat as is indicated by the title.

**WRC Comment 2** (paragraph 1 on page 2): It is well understood that coastal development has many adverse impacts on the beach ecosystem. The EA fails to acknowledge that the project's beach disposal plan will, at a minimum, sustain the current level of development in Brunswick County. However, the more likely scenario is that it will encourage additional development in the maintenance disposal areas located on Bald Head Island and Caswell Beach. Furthermore, the one-time disposal slated for the Brunswick County beaches outside of the maintenance disposal area may afford those communities the time necessary to enroll in the long-term Federal Shore Protection Program provided that there is sufficient sand available to warrant such efforts. If that is the case, the project will serve to increase the amount of coastline that will undergo regular beach nourishment activities and potentially increase the level of development on those beaches.

**Corps Response:** Noted.

**WRC Comment 3** (paragraph 2 on page 2): Past beach nourishment projects in North Carolina have been implicated with inlet migration. For this reason the Corps of Engineers should be prepared to answer questions pertaining to actions to be taken if inlet migration is accelerated by the large amount of material placed in the littoral zones of Brunswick County beaches. In fact, this information should be included in the environmental documentation so cumulative impacts can be adequately assessed.

**Corps Response:** The Wilmington District is not aware of cases where beach nourishment in North Carolina has induced inlet migration. The major beach nourishment projects in North Carolina include Wrightsville Beach, Carolina Beach, and Kure Beach, neither of which has ever been associated with inlet migration. In addition to these designed storm damage reduction projects, the Corps of Engineers regularly deposits navigation maintenance material from the Morehead City Harbor project along the shorelines of Atlantic Beach and Fort Macon State Park. Two rather large disposal operations have occurred with this project, one in 1986 and another in 1994. Both operations involved the disposal of 4 to 5 million cubic yards of material. Again, these disposal operations have not had any impact on Beaufort Inlet particularly on the migration of this inlet.

With regard to the sand management plan for Wilmington Harbor, the plan is basically aimed at reintroducing littoral shoal material back into the system. This is in keeping with the coastal management

policies of the State of North Carolina. With regard to the disposal plan, material will be placed on the east end of Oak Island and Caswell Beach beginning at a point approximately one mile west of the Cape Fear River Entrance. Disposal in this location will not have any impact on the rate of littoral transport into the entrance as the east end of Oak Island (North Carolina Baptist Assembly Grounds) is a sand rich beach segment which is presently supplying 100 percent of the potential sand transport to the entrance. In other words, adding more sand to the beach west of the Baptist Assembly Grounds will not increase the rate of littoral transport to the inlet as waves are currently transporting sand at the maximum possible rate. Also, the net movement of sand along the beach west of the Baptist Assembly Grounds is to the west, therefore, most of the material placed on east Oak Island and Caswell Beach will be transported away from the inlet.

Disposal on Bald Head Island will also not have any impact on inlet migration. Even though Bald Head Island has experienced accelerated erosion in the recent past, the beach is still rich in littoral sediment. Accordingly, sand transport off of the island toward the Cape Fear River Entrance is presently occurring at a maximum rate dictated by the prevailing wave energy. Deposition on the island will simply add material to the sand rich system and will not increase the rate of sand movement to the entrance but will only serve to maintain the shoreline in its present location. Deposition of dredged material on Bald Head Island has occurred on three separate occasions, 1991, 1996, and 1998. The 1991 and 1998 operations were associated with the maintenance of the Wilmington Harbor project while the 1996 operation was a privately funded beach nourishment operation by the Village of Bald Head Island. There has been no measurable change in the behavior of the Cape Fear River Entrance as a result of these beach disposal operations.

The sand management plan for the Wilmington Harbor Entrance Channel is designed to conserve the limited sand resource in the area. Since no new sources of littoral sediment exist, the material presently moving in the system is all that will ever be available. To continue to deposit this limited resource in the ocean disposal areas would have far greater cumulative impacts on the stability of the adjacent beaches and the ecosystems they support than the occasional beach disposal of the navigation maintenance material.

**WRC Comment 4** (Specific Comments, Channel Blasting, paragraph 1, page 2): According to the EA, blasting tests conducted for the project in 1998 and 1999 indicated that air bubble curtains are not effective in reducing blasting impacts on aquatic life. However, Appendix B (Analysis of Test Blast Results) on page B-3 reports a 16% reduction in apparent survival (loss of equilibrium) for caged striped bass, mullet, and killifish located 70 feet away from the blast site without a bubble curtain. While we can appreciate the cost and logistical difficulty of deploying bubble curtains, we question whether they can be summarily dismissed as "not effective". There was indeed greater survival of more laterally compressed (hence more susceptible to blast injury) species like striped bass when a bubble curtain was deployed. Since anadromous river herring, hickory shad, and American shad exhibit greater lateral compression than striped bass, we expect these untested species would be more vulnerable to blast injury than striped bass. The proposed blasting window of August 1 through January 31 should avoid impacting spawning and larval anadromous species, but out-migrating adults and juveniles may be impacted during late summer and early fall despite the reduced blasting area anticipated.

**Corps Response:** Page B-3 states that "there appeared to be about a 16 percent reduction in **apparent** survival (loss of equilibrium) with no air curtain for striped bass ..." (bold added for emphasis).

However, the next sentence states that “However, the apparent reduction is probably not related to operation of the air curtain (Corps 199a),” but just by chance the pressures caused by the non-air curtain blasts were greater than the pressures caused by the air curtain blasts.

Impacts on out-migrating adults and juveniles should be minimized since as indicated on page B-8 of the EA, if schools of fish are detected within a radius of 500 feet of a blast area, the blast would be delayed until the school left the 500 foot-radius. No fishery resources are expected to be impacted, including larvae, outside the 500-foot radius. Also see paragraph 11.00 of the FONSI regarding monitoring and other Environmental Commitments.

**WRC Comment 5** (last paragraph on page 5): Although reducing blast area, stemming blast holes, and time-delaying blasts should serve to reduce fish mortalities, some mortality will still likely occur. Therefore, we strongly recommend that blast-induced fish mortality be treated like any other fish kill having a known cause. Dead and dying fish should be picked up, identified to species, measured (length) and counted so that replacement costs can be calculated. Size and abundance of small fish like anchovies that are quickly ingested by birds following a blast could be estimated. Quantification of fish mortality would do two important things: (1) allow fish replacement costs to be assessed for this specific project and (2) provide real blasting impact data that can be used to assess future channel blasting impacts in North Carolina.

**Corps Response:** The channel net set downstream of each blast should provide an estimate of what is killed or injured and remains near the bottom. During the test blasting an attempt was made to recover some of the fish observed at the surface. There were two problems with this. First, we have to wait for an all clear (all charges detonated) before we can approach the blast area. Generally a minute or so passes before the all clear is given. Second, by that time the dead and injured fish have washed down current of the blast and the birds are consuming the fish. Generally after 5-10 minutes, fish were no longer available at the surface. Of the dead and injured fish observed during the test blasting, most of them were anchovies 3 inches or less in length, and the rest of the fish were generally less than 2 inches long. There was no direct loss of a recreational or sport fishery since we did not observe any dead or injured fish larger than 6 inches. Therefore, an attempt to collect fish at the surface would provide little if any meaningful results.

In addition as indicated above and on page B-8 of the EA, if schools of fish are detected within a radius of 500 feet of a blast area, the blast would be delayed until the school left the 500 foot-radius. No fishery resources are expected to be impacted, including larvae, outside the 500-foot radius. Also see paragraph 11.00 of the FONSI regarding monitoring and other Environmental Commitments.

We do not believe that assessment of fish replacement costs is appropriate for this project since impacts have been minimized to the extent feasible and it is a publicly funded project representing the overall best interests of the State of North Carolina (the non federal project sponsor).

**WRC Comment 6** (Beach-Using Birds, paragraph 1, page 3): Although we have little data on the use of the beaches in question by listed piping plovers during migration, we know the use is considerably higher than during the winter or breeding seasons. The EA states that deposition on Bald Head Island, part of Oak Island and Holden Beach (where we know wintering and migrating piping plovers are found) will

receive dredged material during colder months. For this reason we recommend a monitoring regime to assess the numbers and locations of piping plovers in the project area throughout the non-breeding season in the project area (Bald Head Island, Caswell Beach, Oak Island, Holden Beach). Although somewhat less use of the area is expected in winter than during migration, little is also known about this time period. Information from these surveys can be used to help avoid impacts to the birds by reducing disturbance from tractors, pipelines and other activities or equipment. One survey of the entire area each month should be sufficient. There is no need to survey areas where the beach has moved so that structures (houses) are below high tide. These results should be reported to the NCWRC to be included in the piping plover database.

**Corps Response:** Due to the uncertainties of the potential impacts of disposal of sand on the beach year-round, some additional monitoring is justified. These uncertainties concern beach disposal impacts on sea turtles, larval and juvenile fishes, shorebirds, and surf zone invertebrates. The Corps will address these issues through the development of an integrated monitoring plan. This plan will be developed through coordination with all interested agencies or individuals, and it should be implemented by the fall of 2000. See paragraph 11.00 of this FONSI regarding monitoring and other environmental commitments.

**WRC Comment 7** (Paragraph 2 , page 3): The EA states that after dredge material deposition, the affected beach should recover (from a macro-invertebrate standpoint) within one to two years after deposition. Since maintenance dredging of the channel will be needed every two years, and that material will go to Bald Head Island and Caswell Beach, these beaches will be unproductive for shorebird foraging most of the time. Furthermore, since many other beach nourishment projects have occurred recently or are planned in the near future, a more in depth look at cumulative impacts to beach macro-invertebrates is needed.

**Corps Response:** Disposal on the beaches associated with maintenance of the harbor will occur on a 2 year frequency but probably only a particular section of beach would receive maintenance dredge material every six years. See paragraph 5.06 of the EA. Impact to beach macro-invertebrates can occur due to beach nourishment, but impacts should be minimized with maintenance occurring during the colder months. However, due to the uncertainty of the impacts of such disposal on beach macro-invertebrates, the Corps will address your concerns through the development of a monitoring plan aimed at identification and quantification of potential impacts. It is anticipated that this plan will be developed through coordination with all interested agencies or individuals and that it will be implemented in the fall of 2000. See paragraph 11.00 of this FONSI regarding monitoring and other environmental commitments.

**WRC Comment 8** (Paragraph 3 , page 3): As planned, Bald Head Island (West Beach and South Beach) will be nourished during the non-breeding season for nesting terns. If by chance schedules are disrupted and Bald Head has activities associated with this project during the bird nesting season, it should be surveyed for least tern nesting activity, and these nesting colonies should be avoided.

**Corps Response:** Agreed, but we do not anticipate disposal during the bird nesting season.

**WRC Comment 9** (Sea Turtles, Disposal of Sand on Sea Turtle Nesting Beaches, bottom of page 3 through first paragraph on page 4): There are three main issues with regard to the Wilmington Harbor

Realignment Project's (hereafter referred to as the Project) impact on sea turtles. The first involves the disposal of sand on sea turtle nesting beaches and the second involves the continuous use of a hopper dredge in the lower harbor and new ocean bar channel for an 18-month period. A third issue involves potential impacts to turtles from the ocean bar channel relocation. Each concern is discussed below.

North Carolina's ocean-facing beaches provide important nesting habitat for several sea turtle species. Loggerheads (*Caretta caretta*) are regular nesters on the state's ocean-facing beaches and lay an average of 600 nests per year. Since 1989, between 34% to 49% of the state's annual loggerhead nesting activity occurred on Brunswick County beaches. Green turtles (*Chelonia mydas*) nest intermittently in North Carolina. Over 75 green turtle nests have been recorded in this state since 1980, of which 20 were deposited on Brunswick County beaches. In 1992, a Kemp's ridley (*Lepidochelys kempi*) nest was laid on Oak Island, Brunswick County. And finally, our state's first record of a leatherback (*Dermochelys coriacea*) nest dates back to 1966 when a number of leatherback hatchlings were found at Cape Lookout National Seashore on the south end of South Core Banks (Palmer and Braswell 1995). In 1998, at least two leatherback nests were laid at Cape Hatteras National Seashore on the south end of Hatteras Island near Avon (is not known whether a third crawl found in the same area resulted in a nest).

It has recently been discovered that North Carolina loggerhead nesters belong to a genetically distinct United States nesting assemblage known as the Northern Nesting Subpopulation (NNS), whose range extends from the North Carolina/Virginia border to approximately Cape Canaveral, Florida (TEWG 1998). Because the NNS is a genetically separate subpopulation, regional dispersal of loggerheads is not sufficient to replenish the nesting assemblage should it be extirpated. At this point it is not clear whether NNS is declining or holding stable. Either way, given that the current average of 6,200 per year has not increased noticeably since the late 1980's, it appears unlikely that the NNS's recovery goal of 12,800 nests will be achieved in the foreseeable future (TEWG 1998). As such, all adverse impacts on loggerhead nesting activity in North Carolina have taken on a far greater biological significance and therefore should be afforded much more consideration than they have in the past.

**Corps Response:** Noted.

**WRC Comment 10** (Bottom paragraph on page 4): There are several concerns associated with the Project's proposed disposal of beach quality sand on sea turtle nesting beaches (hereafter referred to as beach nourishment). The first involves the direct impacts resulting from disposal during the nesting season. According to the EA, beach nourishment will be conducted up to a continuous 18-month period, which will encompass one entire nesting season and at least part of another. Beach nourishment requires the presence of a large pipeline as well as heavy equipment on the beach. Such large obstructions impede nesting females' access to the base of the primary dune where they typically nest. Additionally, the sand slurry that is deposited on the beach is unsuitable for nesting and more importantly, may bury existing nests in the disposal area. A loss of nests can occur even with highly trained nest monitors patrolling the disposal site. Under normal survey conditions, it is estimated that even the most experienced nest monitors (Schroeder 1994) miss up to seven percent of the nests. One could expect the percentage of missed nests to increase due to beach nourishment activities that often obscure crawls (e.g., broadcasting of sand slurry, frequent movement of heavy equipment and pipes). Furthermore, all nests laid in the disposal area will require relocation. The moving of nests may reduce hatching success (Limpus et al. 1979). Additionally, nest relocation often alters the eggs' incubation environment significantly, which may



effect the physical character of emergent hatchlings (i.e., hatchling size and weight, embryonic and post-hatchling growth rates, swimming ability and endurance) and ultimately the hatchlings' survivability (Foley 1998). The EA does not offer any information with regard to the amount of equipment and pipeline that will be on the beach at any given time other than a brief comment that approximately one mile of beach per month will be affected by nourishment activities. Nor does the EA explain how the equipment will be moved and repositioned to minimize impacts on nesting turtles. Additionally, the proposed nourishment activities will involve around-the-clock disposal during the nesting season, which will require the use of lights on the beach to maintain an acceptable level of safety for the workers. It is well understood that artificial lighting causes disorientation among hatchlings and results in high hatchling mortality (Witherington and Martin 1996). Furthermore, artificial lighting can deter nesting females from coming ashore to nest. The EA does not address lighting impacts nor does it explain how they will be minimized.

**Corps Response:** Continuous disposal on the beach for a 18 month period is a maximum case scenario and was indicated in case it did occur due to unexpected contract and equipment delays. Currently we believe that a 14-month period is more likely if up to 6 million cubic yards of sand is placed on the beaches. However based on recent data from the ocean bar area, the total volume should be closer to 5.6 million cubic yards which probably mean something less than 14 months.

The project is designed such that pipelines and equipment will not block sea turtle access to potential nesting sites. Normal contract language is as follows and will be included for the proposed project:

*From May 1 through November 15, construction pipes that are placed parallel to the shoreline will be placed as far landward as possible when passing over completed sections of the project. Temporary storage of pipes and equipment shall be off of the beach.*

Disposal on all of Holden Beach, Bald Head Island, and the eastern end of Oak Island will occur during the cooler months when nesting does not occur. For the rest of Oak Island where disposal will take place during the nesting season, nest relocation may alter the nest hatching success and some hatching survivability, but for most of this area, the nests that are attempted now are already being relocated. Any nests that were not moved because they were missed would be lost since erosion has precluded the areas from being successful nesting habitat. Even on the remaining two miles on the western end of Oak Island where all nests located are not moved, still 30 to 40 percent are moved due to nests being laid in areas where success would not be likely. Under the proposed action, the only difference is that the remaining nests would be relocated in this two-mile area. However continuous disposal has the advantage of the beaches being restored to a width and height suitable for turtle nesting at least 1 year sooner than if disposal would occur just during the cooler months.

Lights associated with equipment on the beach where beach disposal is occurring will not affect hatchlings. The nests that may have occurred there would have already been relocated. However normal contract language is as follows and will be included for the proposed project:

*From May 1 through November 15, all lighting on the beach associated with project construction shall be minimized to the maximum extent practicable while maintaining compliance with all safety*

*requirements. Reduced wattage and special fixtures or screens to reduce illumination of adjacent beach and near shore waters shall be used if practical.*

**WRC Comment 11** (page 5, paragraphs 1&2): Another related concern is the impact beach nourishment will have on future nesting activity in Brunswick County. Several studies conducted in Florida, which examined the effects of beach renourishment on nesting success, revealed an increase in non-nesting emergence (false crawl) ratios (Lund 1986; Bagley et al. 1994) and a reduction in the nesting proportions (nests / nests + false crawls; Crain et al. 1995; Steinitz 1996) while other studies revealed no significant differences in nest to false crawl ratios (Ryder 1993; Ehrhart 1995). The studies that reported significant decreases in nesting success attributed the reduction to increased escarpment formation, increased compaction levels, and/or other changes in the beaches' physical characteristics. Many of these same studies, along with others (Crain et al. 1995) reported that nesting activity returned to pre-nourishment levels after a period of one to four years or the length of time- it took for beaches to regain their natural profile and sand characteristics (hereafter referred to as recovery). These findings have serious implications for those beaches within the Project's maintenance disposal area (i.e., Bald Head Island and Caswell Beach) slated to undergo regular nourishment (Magron and Parkinson 2000). Currently, the Corps proposes to perform maintenance dredging every two years. Bald Head Island will receive dredge material from two consecutive maintenance cycles while Caswell Beach will receive sand every third cycle (every six years). At this point, it is difficult to predict how long it will take for each beach to recover from a nourishment cycle. Therefore, we strongly recommend that the Corps carefully monitor each site to establish the length of their recovery periods. Once that information is available, the Corps will be able adjust the disposal schedule to optimize nesting success in both areas.

It is not clear what effect beach nourishment has on the quality of turtle nesting habitat (Crain et al. 1995). For example, the deposition of sand may change the beach's sand color thereby affecting sand temperature. Because sea turtles exhibit temperature-dependent sex determination, beach nourishment could alter sex ratios of nests deposited in nourished areas. Beach nourishment may influence other physical characteristics of beaches such as sand-grain size and shape, silt-clay content, sand compaction, moisture content, porosity/water retention and gas diffusion rates. The altering of one or more of these physical characteristics may not necessarily impact beach selection by nesting females (Crain et al. 1995) but may reduce reproductive success of nests laid in nourished areas (Ackerman 1996). Moreover, such alterations may affect the fitness and survivability of emergent hatchlings (Foley 1998). There is little to no information available on the effects of beach nourishment on the quality of nesting habitat in North Carolina. As such, the Corps should consider revising their current sea turtle nesting monitoring protocol to include the collection of additional data that would help to address some of the potential impacts listed above. The North Carolina Wildlife Resources Commission is willing to assist with the development of a new monitoring protocol.

**Corps Response:** Due to the uncertainties of the potential impacts of disposal of sand on the beach year-round, some additional monitoring is justified. These uncertainties concern beach disposal impacts on sea turtles, larval and juvenile fishes, shorebirds, and surf zone invertebrates. The Corps will address these issues through the development of an integrated monitoring plan. This plan will be developed through coordination with all interested agencies or individuals, and it should be implemented by the fall of 2000. See paragraph 11.00 of this FONSI regarding monitoring and other environmental commitments.

**WRC Comment 12** (Hopper Dredging Impacts on Sea Turtles, page 6, paragraph 1): North Carolina's inshore and nearshore waters provide important developmental habitat for immature loggerheads, greens, and Kemp's Ridley virtually year-round (Epperly et al. (1995). Leatherbacks are known to occur in our nearshore waters primarily in May and June as they migrate north along the Atlantic Coast. Leatherbacks have also been sighted intermittently in Cape Lookout Bight and less frequently in Core and Pamlico Sounds. Hawksbills (*Eretmochelys imbricata*) are very rare in North Carolina with only three confirmed sighting on record, one of which was found in the Cape Fear River (Sheryan Epperly, NMFS, personal communication). Stranding data collected in Brunswick County by the North Carolina Sea Turtle Stranding and Salvage Network suggest that the period of highest turtle abundance in the project area extends from May - September. However, inlets such as the one located at the mouth of the Cape Fear River may have increased sea turtle abundance during migration periods because they serve as travel corridors for the immigration of turtles into warming inshore waters in the Spring (April-June) and subsequent emigration out of cooling inshore waters in the Fall (October-December).

**Corps Response:** Noted.

**WRC Comment 13** (Page 6, paragraph 2): Hopper dredges are known to take sea turtles in state waters. Unfortunately, the EA does not provide any of the incidental take data collected in North Carolina. Furthermore, it does not include any of the incidental capture data the Corps collected during its 1997 debris removal project in the Wilmington Harbor whereby TED-less shrimp trawlers were deployed to collect debris that accumulated in the harbor following Hurricanes Bertha and Fran. The inclusion of these data would have offered good information on the extent of hopper dredge-related mortality in North Carolina as well as provide additional information on sea turtle abundance within the project area. Statewide stranding data show that the majority of Kemp's Ridley and green turtles that occur in state waters are juveniles with a mean straight carapace length of 33.5 cm (SD  $\pm$  8.9 cm) and 30.3 cm (SD  $\pm$  8.0 cm), respectively. There is a concern that onboard observers will not be able to detect the presence of parts from small turtles that succumb to hopper dredging activities. Therefore, we ask the Corps to provide size class information on past Kemp's ridley and green turtle takes as well as provide any additional assurances that small turtle takes will not go undetected by onboard observers.

**Corps Response:** The last turtle we took on the ocean bar portion of the channel was on 4/7/97; however, we've taken turtles on interior portions of the river since that time. At the MOTSU basins adjacent to the Wilmington Harbor Ship Channel near river mile 10 (10 miles upstream of the ocean bar), the hopper dredge McFarland took sea turtles in the center and south basins on 9/25/97, 10/1/97, and 10/4/97, before we shut down that job. All the turtle takes in 1997 were loggerheads. The following year in the Ship Channel near river mile 8, we took a green sea turtle on 9/1/98 in Horseshoe Shoal channel and then took a loggerhead on 9/7/98 in the same vicinity before shutting down that work.

The TED-less trawling in 1997 was not related to Bertha or Fran but was performed to remove debris that had drifted onto commercial fishing grounds from the Ocean Dredged Material Disposal Site (ODMDS). Between April 14 and May 24 1997, 1,406 tows were made that averaged about 30 minutes each. During that period, 19 sea turtles were captured in the debris nets. The catch included 14 loggerheads and 5 Kemp's Ridley turtles. All turtles were released in good condition. Twelve turtles were tagged with front flipper tags (on both flippers). The turtles not tagged were considered too small to tag.

None of the tagged turtles were recaptured. One boat reporting sighting, but not capturing, a leatherback sea turtle on April 18, 1997.

The smallest dimension on all of these turtles taken was a Kemp's Ridley turtle taken during the debris trawling, and it had a carapace length of 22.9-cm (9 inches). Given that the basket screens on the hopper dredges have to have 4-inch mesh, if a hopper dredge had taken these turtles, they would have been retained in the baskets. In addition, for the carapace length data provided in the Wildlife Resources Commission comment, most of these turtles would have been collected by the hopper dredge screens. Assuming that the carapace data was normally distributed, 97.5% of the Kemp's and green turtles would be greater than 6.2 and 5.6 inches in carapace length, respectively (i.e. mean length - 2SD).

**WRC Comment 14** (page 6, Turtle Impacts from a Relocated Ocean Channel, paragraph 1): In addition to the two issues discussed above, there is one more that may have long-term impacts on sea turtles; the moving of the ocean bar channel closer to the Wilmington Offshore Fisheries Enhancement Structure (WOFES). The EA states that there may a rise in turtle takes during the construction and maintenance of the new channel because of its increased proximity to WOFES, which supports a reef-like community that may attract turtles. If turtles do congregate in the vicinity of WOFES, they may also stand a greater chance of getting struck by propellers from large ships utilizing the channel. It is not uncommon for turtles that have been cut in half to strand on beaches adjacent to major shipping channels. The cause of these strandings has often been attributed to ship propeller strikes (Wendy Teas, NMFS, and personal communication). The EA does not acknowledge this potential long-term impact on sea turtles.

**Corps Response:** Increased strikes of sea turtles by ship propellers could occur as a result of the new channel alignment being closer to the WOFES. The frequency of such occurrence is not known but the frequency is expected to be low since the WOFES is located at least ½ mile away.

**WRC Comment 15** (page 6, bottom paragraph): A final concern is the potential for the new channel alignment to accelerate beach erosion along southwestern Bald Head Island, resulting in a loss of sea turtle nesting habitat in this area. The wave transformation analysis described on p. 27 of the EA predicts no difference in sediment transport potential associated with the new alignment, but we question whether this accounts for increased tidal (water) velocity closer to this beach.

**Corps Response:** The total sand management package for the Wilmington Harbor project includes a detailed monitoring program aimed at determining post-project shoreline change on Bald Head Island and east Oak Island-Caswell Beach. The results of this monitoring will be used to direct the disposal operations for the harbor project. The proper management of the limited sand resource will serve to preserve and possibly enhance sea turtle nesting habitat on both beaches. The wave transformation analysis that was performed for this project did not indicate any change in sediment transport potential associated with the new bar channel alignment. Also, hydrodynamic modeling performed in conjunction with the planning and design of the harbor project did not show any substantial change in tidal currents in or near the harbor entrance. The establishment of the detailed monitoring program as an element of the sand management plan acknowledges uncertainties associated with these types of predictions and provides a means to adjust the operation of the project to minimize project impacts. See paragraph 11.00 of this FONSI regarding monitoring and other environmental commitments .

**WRC Comment 16** (page 7, paragraph 1): It should be obvious that we have a number of concerns with the EA. We recommend that these concerns be fully addressed in the next environmental document, be it a revised EA or Environmental Impact Statement. Thank you for the opportunity to comment. If you have questions, please call David Allen (252 448-1546), Ruth Boettcher (252 729-1359), or Bennett Wynne at (252) 522-9736

**Corps Response:** We believe that all your comments have been adequately addressed in this FONSI, and another environmental document is not required.

**6.10 Wildlife Resources Commission, letter dated March 31, 2000**

The text of this letter is the same as addressed in paragraph 6.09 above.

**6.11 Division of Marine Fisheries, letter dated March 30, 2000**

**DMF Comment 1** (paragraph 1): The North Carolina Division of Marine Fisheries has concerns and/or objections to various parts of this document. Seasonal dredging windows in the Cape Fear River were modified several years ago to allow dredging from August 1 through January 31. This shift was done to protect migrating anadromous fishes from disturbances as well as provide more protection to larval and juvenile organisms. This restriction was for the entire Cape River estuary not just from Lower Swash Channel (about river mile 3) upstream as stated on page 10. In the Division's opinion, the Cape Fear estuary begins behind a line drawn from the southwestern corner of Bald Head Island to the southeastern corner of Oak Island. This would include Smith Island Channel in the estuary and to the seasonal restrictions. The Division is mandated by the Atlantic States Marine Fisheries Commission to recover American shad stocks. This species migrates up the Cape Fear River primarily from February through April. Studies have demonstrated that hydraulic dredging activities disrupt this upstream movement. Thus, Smith Island Channel should fall within the seasonal restriction. Additionally, the Division opposes any relaxation of the seasonal windows during construction as proposed in the document (page 11.). These windows were decided upon after considerable discussion, and while effective, do not fully protect marine organisms.

**Corps Response:** As indicated on table 4 of the EA, we have received concurrence via several NEPA documents to dredge year-round in the lower river from Battery Island Channel offshore through Bald Head Shoal Channel (including Smith Island Channel). In addition, the use of a bucket and barge dredge is currently allowed year-round from Big Island Channel downstream. No dredging is proposed in non-sandy areas outside the fishery window, except for the use of a bucket and barge dredge in the area already approved. We are not aware of any new information that would necessitate the modification of these clearances. The study you mentioned that indicated hydraulic dredging disrupts upstream movement of shad was performed by Dr. Mary Moser, Distribution and Movements of Shortnose Sturgeon (*Acipenser brevirostrum*) and Other Anadromous Fisheries of the Lower Cape Fear River, North Carolina May 1993. Shad moving upstream past the Wilmington area either remained in the main ship channel or used the Brunswick River. During the tagging study, a hydraulic pipeline dredge was operating in the ship channel between the mouth of the Brunswick River and the State Port. Of the tagged shad that went past the mouth of the Brunswick River and approached the dredge, less than half of them reversed course apparently to avoid the dredging operation and then proceeded up the Brunswick River. Most of the shad

moving up the main ship channel past the dredging operation continued upstream. The harbor conditions in the river where the dredge was operating are considerably different from those in the vicinity of Smith Island Channel. The river where the dredge was operating is less than 1,500 feet wide while in the Smith Island Channel the river is over 1 mile wide. Based on this information it is not likely that shad would be precluded from moving upstream past a dredge operating in Smith Island Channel.

In addition, not allowing year-round dredging in the lower harbor from Horseshoe Shoal Channel downstream would greatly reduce our ability to construct and maintain the project. For example, the sandy material in islands 3 and 4 and the adjacent channels would be pumped to the Kure Beach area to accomplish routine renourishment activities. In the NEPA documents for this project, renourishment can only take place during the cooler months when turtles are not nesting or hatching. If we were restricted to the fisheries window in these sandy areas, disposal could only occur during December and January, which is not enough time to complete the work. A similar situation would occur in the channels near the inlet for disposal of sandy maintenance material on the Bald Head Island and Caswell beaches.

Therefore in conclusion, we believe that the dredging and disposal methods along with the proposed monitoring as described in the EA are acceptable. Also, see paragraph 11.00 of this FONSI regarding monitoring and other environmental commitments.

**DMF Comment 2** (paragraph 2): The impacts of blasting need to be further studied. Immediately after a blast a survey should be done of the impact area to determine quantity and identity of fishes killed (prior to their being consumed by fishes). The channel net downstream may collect some of the dead organisms but during the blasting tests, few of the dead fishes released off the blasting barge were recovered by that gear. Data should be shared with the agencies and if the losses become too severe, in the agencies' opinion, then other measures should be taken to reduce loss.

**Corps Response:** see paragraph 6.09, response to comment 5.

**DMF Comment 3** (paragraph 3): Studies proposed to assess impacts on the benthos and Primary Nursery Areas are adequate.

**Corps Response:** Noted.

## **7.00 LOCAL AGENCIES**

### **7.01 Brunswick Beaches Consortium, letter dated March 29, 2000**

**BBC Comment:** The Brunswick Beaches Consortium is the lead group representing Brunswick County and all the Brunswick County beach municipalities in matters pertaining to regional beach preservation and sand management. We strongly and vigorously support the placement of all beach-quality sand derived from the dredging of the Wilmington Harbor Channel onto the qualifying adjacent beaches of Brunswick County without delay. The positive benefits to our beaches overwhelmingly support this action.



We support, and will cooperate with, any and all reasonable efforts to resolve any challenges pertaining to threatened and endangered species habitats and other such issues that would allow the sand placement portion of the project to proceed at its most rapid pace to completion.

**Corps Response:** Noted.

## **8.00 ELECTED AGENCIES**

### **8.01 New Hanover County Board of Commissioners, letter dated March 10, 2000**

**NHCBC Comment:** I am writing in support of the Wilmington Harbor Project and the Corp's Finding of No Significant Impact for the draft Environmental Assessment. The Board of County Commissioners believes that this project will yield substantial benefits, environmental as well as economic, for all citizens of North Carolina.

The Wilmington Harbor Project will increase the navigation channel on the Cape Fear River from 38 to 42 feet and will realign the ocean bar entrance to the river. This modification in the project will avoid the need for rock blasting and avoid negative impact on live coral on the existing site. The ocean bar entrance will lower the total project cost by millions of dollars and will ensure the project remains on schedule.

The Port of Wilmington serves as a gateway to global markets for North Carolina business, industry and consumers. The widening of the channel will allow the Port to keep current customers and to remain competitive in attracting new business. Expanded activities at the Port will mean more jobs and tax revenues for citizens across the state.

On behalf of the New Hanover County Board of Commissioners, I encourage your Finding of No Significant Impact for the draft Environmental Assessment so the project can move forward as quickly as possible.

**Corps Response:** Noted.

### **8.02 Daniel F. McComas, North Carolina General Assembly, House of Representatives, letter dated March 13, 2000**

**McComas Comment:** It is my pleasure to give my endorsement on the Wilmington Harbor Project, as I believe it will provide substantial benefits, environmental as well as economic, for all citizens of North Carolina.

The Wilmington Harbor Project is truly a win-win situation for all North Carolina citizens for environmental and economic benefits, with taking the navigation channel on Cape Fear River from 38 to 42 feet.

The realignment of the ocean bar entrance provides many environmental positives by avoiding large concentration of rock, and live coral bottom at the existing site. This entrance also frees up the

existing site for backfill and non-beach quality materials from deepening and maintenance of the inner harbor reaches. It will reestablish fishing and shrimping grounds for reclamation by local commercial fishermen and shrimpers, not to mention this will lower the total project cost by millions of dollars and keep the project on the proposed timetable.

We need to protect North Carolinas beaches from potential damage of hurricanes and erosion. Sand from the deepening project will be used for this purpose.

Ports in Georgetown, Charleston, and Savannah will also be dredged. It is important for Wilmington to remain competitive, and with the new 42-foot navigation channel, we should be able to accomplish this task.

Global economy has brought about larger ships, with which Wilmington must have the capability to serve these ships.

**Corps Response:** Noted.

#### **8.03 Mayor Harry Simmons, Town of Caswell, letter dated March 29, 2000**

**Simmons Comment 1** (page 1, paragraph 1): Our town would be a primary beneficiary of the disposal of beach-quality sand from this project and, as such, we wholeheartedly support the project and do not wish to see it delayed in any way.

**Corps Response:** Noted.

**Simmons Comment 2** (page 1, paragraph 2-4): That said, we still have a few typographical errors to point out and a couple of comments:

On page 6, the table pertaining to Section 933 disposal, the next to last row should read only "West Oak Island".

In Appendix A, Page 4, Table 1, the last row above "Totals" should read "East Oak Island - Caswell Beach

In Appendix A, Page 6, Table 2, the next to last row should read only "West Oak Island".

(Generally speaking, wherever the words "West Oak Island" are used in the EA, the words "Caswell Beach" should not also be associated. In places where the words "East Oak Island" are used, the words "Caswell Beach" should usually be associated.)

**Corps Response:** Agreed.

**Simmons Comment 3** (page 1, bottom paragraph): We request regular Corps monitoring of subsequent ocean shoreline erosion rates to determine whether the new alignment of the Channel has a positive or negative impact on the ocean shoreline of Caswell Beach. We request that all findings from such monitoring be shared with the Town of Caswell Beach prior to any disposal of future maintenance

dredging spoils and that adjustments be made in such disposals to overcome any negative impacts on Caswell Beach.

**Corps Response:** As indicated on page 10 Appendix A, in terms of percentages, approximately 66 percent of the sediment shoaling the entrance channel comes from Bald Head Island while 34 percent is derived from Caswell Beach. In order to maintain the sediment balance on both islands, littoral material removed from the entrance channel will be placed back on the beach from whence it came. Accordingly, two out of every three cubic yards of littoral shoal material removed from the entrance channel will be placed back on Bald Head Island and the remaining cubic yards placed on East Oak Island-Caswell Beach. The disposal locations on each island will be based on the results of semi-annual beach profile monitoring surveys. See paragraph 11.00 of this FONSI regarding monitoring and other environmental commitments.

**Simmons Comment 4** (page 2, paragraphs 1 & 2): We encourage year-round dredging and disposal of beach-quality sand during this project, with proper monitoring for endangered species, so as to avoid unnecessary demobilization and remobilization of dredging plants and minimize the resulting disruptions to the human environment of Caswell Beach, its residents, property owners and their guests.

The Town of Caswell Beach expects this project to have only positive impacts on the long-term usefulness of our beach as a sea turtle habitat, and will work with our existing authorized and recognized sea turtle monitoring team to maximize those positive impacts.

**Corps Response:** Noted.

**8.04 Mayor Joan L. Altman, Town of Oak Island, letter dated March 23, 2000**

**Altman Comment:** Thank you for the opportunity to comment on the Environmental Assessment Preconstruction Modification of Authorized Improvements, Wilmington Harbor, North Carolina, February 2000.

The Town of Oak Island concurs with the conclusion that the proposed Federal action will not significantly affect the quality of the human environment and an Environmental Impact Statement should not be required.

In addition, the Town of Oak Island agrees to work with the US Army Corps of Engineers as necessary to provide monitoring activities associated with placing dredged material on the beach. The Town endorses action to place dredged material on the beach in a continuous project which would require activity on the Oak Island beach during sea turtle nesting season. The Town understands the importance of maintaining proper, accountable sea turtle monitoring activities during this time and will take necessary actions determined by the U.S. Army Corps of Engineers.

The Town of Oak Island Town Council and I commend the U.S. Army Corps of Engineers, Wilmington District staff on their diligence and professionalism. We look forward to working with you and your staff as this project moves to completion.

**Corps Response:** Noted.

## **9.00 CONSERVATION GROUPS**

### **9.01 National Audubon Society, letter dated March 16, 2000**

**NAS Comment 1** (page 1, entire page): The lower Cape Fear River basin, associated disposal islands, tidal sand flats and beaches of New Hanover and Brunswick Counties have long support a great diversity of birds, sea turtles, and other wildlife. It is our opinion that the modifications as proposed may have a negative impact on nesting seabirds and migratory shorebirds, and potentially sea turtles and inshore fisheries. We address the impact on birds in this letter.

It is well known and understood that seabirds, such as terns, pelicans and gulls, utilize open bare sand and sparsely-vegetated habitats on disposal islands in the Cape Fear River for breeding. In 1999, the disposal islands commonly referred to as "Ferry Slip Island" and "South Pelican Island" supported 27% of North Carolina's Brown Pelicans (1, 172 nests), 25% of North Carolina's Royal Terns (3,070 nests), 27% of North Carolina's Sandwich Terns (653 nests), 16% of North Carolina's Gull-billed Terns (24 nests), and 17% of North Carolina's Laughing Gulls (3,100 nests). These islands have been recognized by the American Bird Conservancy and the National Audubon Society as "globally important" for royal and sandwich terns and "continentally important" for brown pelicans.

These islands were created by the disposal of dredged sand. The habitats on these islands and the islands themselves have been maintained for more than two decades by the periodic renourishment with sand dredged from the adjacent river channel. These islands are essential to maintaining populations of seabirds at their present levels as described by Parnell and Shields (1990) in Management of North Carolina's Colonial Waterbirds (UNC-Sea Grant Publication).

Periodic renourishment of both Ferry Slip and South Pelican Islands, at intervals of approximately seven years is essential to maintaining these seabird nesting sites and North Carolina's current population of seabirds. These islands should not be considered as candidates for "island recycle sites." Rather, they should be maintained at their present size and shape to allow for the continued usage by nesting colonial seabirds. These islands should remain totally off-limits to equipment and personnel from March 15 to September 15. The plan for the disposal of dredged sand from the lower reaches of the Cape Fear River should include the maintenance of both Ferry Slip and South Pelican Islands at their current size and shape. Renourishment of these islands should be coordinated with the NC Wildlife Resources Commission and the NC Colonial Waterbird Management Committee.

**Corps Response:** Agreed. Ferry Slip and South Pelican Islands will not be considered for "island recycle sites", and access to these sites is not proposed for any actions related to the EA. Renourishment of these islands was addressed under the alternatives section of the 1996 EIS. We will continue to periodically provide maintenance material for renourishment of these islands as long as the National Audubon Society or other appropriate organization obtains all necessary permits and clearances for such disposal.

**NAS Comment 2** (page 2, paragraphs 1-3): The beaches of Brunswick County, especially those areas around the mouth of the Cape Fear River and Cape Fear point have been used as nesting sites by least terns, black skimmers, American oystercatchers, and Wilson's plovers. Federally listed piping plovers have been recorded nesting (adjacent to Shallotte Inlet) and wintering on Holden Beach. Little is known about piping plover occurrence on the beaches of Bald Head Island. Disposal of sand on beaches from a period of April 1 to August 31 will jeopardize survivorship of beach-nesting birds if these species have established nesting sites or colonies in the project area. Operation of equipment and disposal of sand should not occur in these areas during the nesting season.

Invertebrates that inhabit the intertidal zone of Brunswick County beaches provide vital food for at least 12 species of shorebirds. Beach disposal of dredged sand disrupts community structure and eliminates intertidal invertebrates, thus eliminating food supply for shorebirds. Although community structure and populations of intertidal organisms may recover given enough time, the maintenance interval stated, "beach placement of about 1.1 million cubic yards of sand every 2 years," does not allow sufficient time for recovery of intertidal invertebrate communities and populations. This will negatively impact shorebirds foraging along beaches in the project area during both spring and fall migrations. Areas with high shorebird usage (primarily those areas not immediately adjacent to beachfront development) should not receive sand from maintenance dredging. Shorebird surveys should be conducted throughout to determine distribution and abundance. Disposal of dredged sand in areas with significant concentrations of shorebirds and areas with federally listed species should be avoided.

The lower reaches of the Cape Fear River and the beaches of Brunswick County are important to bird populations and species diversity in North Carolina. We urge you to take every precaution necessary to minimize the impact of this project on birds, sea turtles, and fisheries in the region.

**Corps Response:** Disposal is not to occur at any inlet and no disposal will take place within 4 miles of Shallotte Inlet. Disposal on all of Holden Beach, Bald Head Island, and the eastern end of Oak Island (Caswell) should occur during the cooler months when nesting would not be expected to occur. For the rest of Oak Island where disposal will take place during the nesting season, erosion has been so severe that wave uprush frequently occurs to the base of the dune, and/or the beachfront is densely developed with houses and walkovers. Either condition would preclude successful nesting in the disposal area.

As indicated in paragraph 5.06 of the EA, maintenance dredging of the ocean bar channel is expected to result in beach placement of about 1.1 million cubic yards of sand every 2 years during the normal disposal window (November 16 - April 30), to the degree practicable. Placement of this sand is planned for Bald Head Island during years 2 and 4 followed by placement on the eastern end of Oak Island-Caswell Beach in year 6. Each disposal event would target beach areas shown through monitoring to be more eroded and in need of sand. Therefore, the beach disposal cycle in conjunction with the erosion criterion would allow at least 2, and possibly several, years to pass between replenishment events for specific sections of beach. Also, since beach sections that receive sand would be those suffering most from erosion, they may likely have reduced habitat values that would benefit from additional sand. Macroinvertebrate populations should recover over substantial portions of these beaches between disposal events, and shorebirds should benefit from restored food supplies provided by these invertebrate populations. Also, habitat for nesting sea turtles should improve through sand replenishment at eroded

beaches. Specific aspects of the proposed action in relation to sea turtles and seabeach amaranthus are addressed in appendix E of the EA. Impact to beach invertebrates and shorebirds can occur due to beach nourishment, but impacts should be minimized with maintenance occurring during the colder months. However, due to the uncertainty of the impacts of such disposal on beach invertebrates and shorebirds, we will coordinate with the National Audubon Society and other agencies to develop an appropriate monitoring plan. See paragraph 11.00 of this FONSI regarding monitoring and other environmental commitments.

## **10.00 COMMENTS FROM INTERESTED BUSINESSES, GROUPS, and INDIVIDUALS**

### **10.01 Burlington Industries, Inc., letter dated March 8, 2000**

**BII Comment:** I am writing to support the Wilmington Harbor Project, which I understand will take the navigation channel on the Cape Fear River from 38 to 42 feet. Realignment of the Ocean Bar Entrance will provide Environmental positives by avoiding blasting of rock and the Impact on live coral bottom at existing site. The New Ocean Bar Entrance will also free existing site for back fill with non-beach quality materials from deepening and maintenance of the inner harbor reaches. The New Ocean Bar Entrance will also lower the total project cost by millions of dollars and will keep the project on schedule. Sand from the deepening project can be used to protect area beaches from hurricanes and erosion, thereby mitigating potentially millions of dollars in damage as well as preserving North Carolina's coastline for generations to enjoy. The Port of Wilmington serves as a gateway to global markets for the North Carolina business community. New 42-foot navigation channel allows the Port of Wilmington to remain competitive and help attract new business. Increase in activity at the Port of Wilmington will mean more jobs and tax revenues for the people of North Carolina. As District Engineer I am sure that you are aware that it is critical that the timetable is preserved or moved ahead.

**Corps Response:** Noted.

### **10.02 H. Spalding Craft, letter dated March 9, 2000**

**Craft Comment:** I am a member of the Board of Trustees of the NC State Ports Authority. While I live in Morehead City, I obviously have great interest in both Ports and in the continued development of Wilmington as a competitive container Port.

It is clear that this continued development is not possible without a successful completion of the Wilmington Harbor Project. I'm sure it has been made abundantly clear to you many times the benefits of the Project even outside of the obvious commercial impacts -items such as environmental benefits and the sand contribution to protect area beaches. I will not repeat these benefits here other than to ask you and the Corps to take them into consideration when deciding the issue of No Significant Impact. I really think that the points that have been made many times are compelling and speak for themselves.

The Wilmington District has been extremely supportive of both Ports and we are very grateful for that. Since I live in Morehead City, I see every day the positive impact of Harbor dredging and the subsequent renourishing of the local beach. The Port is successful and certainly would not be so without the continual support of the Corps. But now the Wilmington Harbor needs a significant improvement and



obviously the Corps is the key to this at this juncture. Your continued support of the North Carolina Ports is earnestly sought and would be greatly appreciated.

**Corps Response:** Noted.

**10.03 Star Shipping Inc., letter dated March 9, 2000**

**SSI Comment:** Star Shipping vessels of up to 46,000 tons deadweight call Wilmington on a regular basis. Wilmington is usually either the final or the penultimate loadport for those vessels. We have had many problems caused by the insufficient water depth available and have had to restrict cargo liftings due to this. Star welcomes the deepening to 42 feet. Our H class vessels can be as deep as 39'6" when fully loaded in saltwater.

We need the extra water, in order to fulfill our commitments to existing customers and to try to increase our bookings. But what is good for Star and other carriers also provides economic benefits for Wilmington and the region, more man-hours for the longshore industry and related vendors.

The Finding of no Significant Impact is a step in the right direction. It means that the project cost will be lowered, completion of the project will be earlier and large areas of natural rock and coral can be left untouched. I understand that sand from the project will be used to protect beaches from erosion and hurricane damage, which has major importance for an area as exposed as North Carolina's coastline.

Therefore, in conclusion I would like to add Star Shipping's support for the project and the Finding of no Significant Impact.

**Corps Response:** Noted.

**10.04 Solar International Shipping Agency, Inc., letter dated March 10, 2000**

**SISAI Comment:** On behalf of Solar International Shipping Agency, general agent for Yang Ming Line in North-America, I am writing this letter in support of a Finding of No Significant Impact for the draft Environmental Assessment.

Yang Ming Line container vessels have been calling on the port of Wilmington, NC for the past two decades. As such, we believe that the Wilmington Harbor Project will be beneficial to the Port of Wilmington and its customers, since it will deepen the navigation channel on Cape Fear River from 38 to 42 feet. The above will enhance the Port of Wilmington capabilities to serve as a gateway to global markets.

Again, as a long-term customer of the port, we are in support of a Finding of No Significant Impact for the draft Environmental Assessment.

**Corps Response:** Noted.

#### **10.05 Andrew Koeppel, letter dated March 10, 2000**

**Koeppel Comment:** It has come to my attention that you are prepared to receive comments relative to the draft environmental assessment released by the Corps of Engineers. It is my understanding that this draft indicates a finding of no significant impact.

Since it is critically important for the project to be completed at the earliest possible time due to the enormous economic benefits that will accrue in the form of more jobs and greater tax revenues, I strongly urge you to proceed with the project as scheduled. It is interesting to note that there are several major advantages to realigning the entrance channel across the ocean bar.

1. By eliminating the need for rock blasting, there will be no potential negative environmental impact on the live coral bottom in the area.
2. The existing back fill site can be used to recruit benthic life forms resulting in new fishing and shrimping grounds that can be utilized for commercial purposes. This will create additional jobs.
3. Sand from the project can be used to renourish beaches that have been depleted by adverse weather conditions.

It should be added that in conjunction with this dredging project I am personally engaged in conversations with the state department of transportation relative to improved highway and rail connections between Wilmington and the rest of the state. It is hoped that within the time frame that this project is completed we will have an interstate quality highway between Wilmington and Charlotte as well as updated rail connections that can be utilized for container shipments.

If this occurs, the increases in freight tonnage as a result of this deepening project will exceed everyone's expectations. Please proceed with the dredging as soon as possible to enable the port of Wilmington to become the preferred ocean freight destination for business not only within our state but also throughout the world.

**Corps Response:** Noted.

#### **10.06 OxyChem, letter dated March 13, 2000**

**OC Comment:** I am writing this letter in support of the U.S. Army Corps of Engineers Finding of No Significant Impact regarding the draft Environmental Assessment for the Wilmington Harbor Deepening Project. The preconstruction modifications will realign the entrance channel across the ocean bar and reduce explosive blasting requirements. These modifications will yield significant environmental benefits, save over \$40 million dollars in costs, and accelerate the project's completion date.

The project modifications will provide substantial environmental benefits. The realignment of the Ocean Bar Entrance will eliminate the need for blasting over 2 million cubic yards of rock and minimize impacts to the live coral bottom at the existing site. The new Ocean Bar Entrance will free up the existing site for backfill with non-beach quality materials from deepening and maintenance of the inner harbor reaches and allow for recruitment of benthic life forms. In addition, sand from the project will be used to protect area beaches from hurricanes and erosion.

As plant manager of a chemical manufacturing plant in North Carolina, I recognize that the current depth of the Wilmington Harbor severely limits its use of cost-effective ships. The project will address critical needs for deeper and wider channels to accommodate the draft requirements of fully loaded cargo vessels and meet requirements for larger ships in the long term. Deepening the Harbor will hold down land transportation costs and lower port service charges, therefore allowing the Wilmington Port to be successful in attracting new business and more effectively engage in world trade.

In summary, I strongly support the Corps' Finding of No Significant Impact concerning the draft Environmental Assessment for the Wilmington Harbor Deepening Project. The project is a win-win situation for North Carolina business, industry, and citizens that will provide both environmental and economic benefits. The project modifications will minimize environmental impacts, lower project costs by millions of dollars, and advance the project's timetable. Completion of the deepening project is a major infrastructure need that will allow the Wilmington Port to expand globally and become more competitive with other ports on the eastern seaboard. This project is vital to the state's economy and growth and will mean more jobs and tax revenue for North Carolina in the future.

**Corps Response:** Noted.

**10.07 Morehead City Terminals, Inc. letter dated March 14, 2000**

**MCTI Comment:** Morehead City Terminals, Inc. supports the draft Wilmington Harbor Project Environmental Assessment on the deepening of the Cape Fear River. Morehead City Terminals operates a bulk handling facility and a short line railroad at the Port of Morehead City. Our company handles about 1 million tons of wood chips annually along with other bulk commodity products serving multiple global customers and clearly understands the need for deeper drafts at our Ports. The proposed deepening project would benefit our business, industry, and consumers across North Carolina.

Based upon the project's environmental assessment, this project ensures numerous positive effects on the ocean bar entrance. These include:

1. Re-establishing fishing and shrimping grounds for reclamation by local commercial fishermen and shrimpers,
2. The existing live coral bottom would avoid impact,
3. Sand from the deepening project would be used to protect area beaches from normal erosion and erosion due to hurricanes,
4. The need to blast 2 million cubic yards of rock has been eliminated.

The proposed modifications to realign the entrance channel across the ocean bar would save over \$40 million in project costs. These modifications are expected to take months, possibly years off the project's duration. A new 42-foot navigation channel would allow the Port of Wilmington to keep current customers and to be competitive in attracting new business. Subsequently, this means more jobs and more tax revenues for the citizens of North Carolina.

Again, Morehead City Terminals, Inc. fully supports the proposed deepening of the navigation channel. We hope that the Harbor Project can proceed on schedule under the existing plans.

**Corps Response:** Noted.

**10.08 Hanjin Shipping Company, LTD, letter dated March 15, 2000**

**HSCL Comment:** I am writing this letter today on behalf of Hanjin Shipping Company, LTD in support of Finding of No Significant Impact for the draft Environmental Assessment.

The Wilmington Harbor Project takes navigation channel on Cape Fear River from 38 to 42 feet, and is a win-win situation for all North Carolina citizens for environmental and economic benefits.

Hanjin Shipping Co. Ltd is a Seoul, Korea based conglomerate. Our vessels call the port on a weekly basis sharing with Yang Ming lines. The particular vessels we utilize on this service are the smallest sized that we use in the North America market place. However, we are barely able to navigate the Cape Fear River due to drafting problems unless we call at high tide.

Our vessels are where today's large global carriers are focused. The dredging and completion of the Cape Fear River is essential if the State of North Carolina is seeking to be a regular "player" in containerized shipping environment for today and the future.

Please take our message very seriously in evaluating and completing this task. Should you have any questions, please call me at 910-251-9377.

**Corps Response:** Noted.

**10.09 North Carolina Citizens for Business and Industry, letter dated March 17, 2000**

**NCCBI Comment:** On behalf of the 2000 members of North Carolina Citizens for Business and Industry, the state chamber of commerce, I am writing to encourage you to approve the Finding of No Significant Impact for preconstruction modifications for the Wilmington Harbor project. This will allow for the deepening of the Cape Fear River navigation channel from 38 feet to 42 feet.

Approval of this Finding will result in a win-win proposition for all concerned. The modifications will be hopefully from both an economical and an environmental basis. There will not be a need to blast over two million cubic yards of rock, and this will save over \$40 million in project costs. This will also save a considerable amount of time.

From an environmental standpoint, the sand from the deepening project will be used to protect area beaches from hurricanes and erosion. This will be of crucial help for our state's number two industry, travel and tourism. It will also enable the Port of Wilmington to keep its current customers and to be competitive for attracting new business. This translates into more jobs and additional tax revenues!

**Corps Response:** Noted.

**10.10 Frank S. Conlon, letter dated March 15, 2000**

**Conlon Comment:** In my role of private citizen who is interested in maritime affairs and the economic progress of Wilmington and the state, I strongly support the Corps Finding of No Significant Impact on the environment attributable to the forthcoming dredging of the Cape Fear River channel.

Reducing the cost of the project by avoiding a great deal of rock, reducing the transit time for ships, enhancing the competitive posture of our port, using the removed sand to protect the jeopardized beaches of Brunswick County are factors which marshal support for undertaking the project as proposed and bringing it to completion as quickly as possible.

In sum, I fully support your Finding of No Significant Impact.

**Corps Response:** Noted.

**10.11 Laela S. Sayigh, letter dated March 20, 2000**

**Sayigh Comment 1:** I am a biologist who studies bottlenose dolphins here in the Wilmington area, and I was recently contracted to do baseline surveys for marine mammals and turtles in the areas that will be affected by the blasts. I have two major concerns about the Environmental Assessment:

The proposal to encircle the area surrounding the blast with a net has the potential to do more harm to marine mammals than the blasts themselves. Dolphins or manatees could become entangled in the net below the surface and drown. Bottlenose dolphins in the Wilmington area are already profoundly impacted by fishing net entanglements. A large net such as is proposed, in an area where dolphins are not accustomed to encountering nets, could be very dangerous. I think it would be more beneficial to focus on comprehensive monitoring efforts to ensure that no marine mammals are in the area prior to a blast. This may require the addition of aerial surveys prior to scheduled blasts, in addition to boat-based surveys.

**Corps Response:** Setting sink gill nets is required by National Marine Fisheries Service under the Biological Opinion issued August 2000. The purpose of the nets is to preclude the endangered shortnose sturgeon from entering the potential blast effect area. The nets will be manned continuously and if a marine mammal or sea turtle is observed nearby then the nets will either not be set or retrieved if already set. In addition the nets will have floats that extend to the surface. If these floats indicate that a large animal has become entangled, the nets will be immediately retrieved and the animal released.

Any night gill net sets (e.g. 4:30 a.m.) prior to any early morning blast (blast can't occur within 2 hours of sunrise), will require monitoring the surface water and net floats with night vision equipment, and using hydrophones to monitor for the presence of dolphin.

Aerial and boat surveys will be required for one hour prior to and ½ hour after each blast event. The area of observation will be a radius of 3,500 feet from the blast. If a marine mammal or sea turtle is observed in this area as indicated above, the nets will either not be set or retrieved if already set. If a

marine mammal or sea turtle is observed in the 3,500 feet radius, blasting will be delayed until they voluntarily leave the area.

See paragraph 11.00 of this FONSI regarding monitoring and other environmental commitments.

**Sayigh Comment 2:** In the event that sound levels are greater than those predicted by mathematical models, marine mammals may need to be kept outside an even wider radius than that specified. Actual sound levels will need to be measured with calibrated hydrophones during blasts to determine the affected radius.

**Corps Response:** The sound levels associated with the blasts will be measured with calibrated hydrophones. If the noise level exceeds the threshold of 178 decibels at 3,500 feet, the monitoring area will be extended outward in 500 foot intervals until the threshold is achieved.

**10.12 Brooks, Pierce, McLendon, Humphrey & Leonard, L.L.P., letter dated March 31, 2000**

**BPMHLL Comment 1** (page 1, first paragraph and paragraph numbered 1): As you know, our firm represents the Village of Bald Head Island with respect to issues raised by the Environmental Assessment, February 2000, Preconstruction Modifications of Authorized Improvements, Wilmington Harbor, Brunswick County, NC. The Village appreciates the opportunity to provide written comments on the assessment, and plans to provide its comments in two parts. This is the first part. We ask that the Corps accept as written comments on this assessment the following correspondence:

1. Letters that Mr. Erik J. Olsen, the Village's coastal engineering consultant, has sent to the Corps concerning the sand management issues of concern to the Village:

October 20, 1999, letter from Mr. Olsen to you and enclosures (Figures 1, 2 & 3)

August 16, 1999, letter from Mr. Olsen to you

July 21, 1999, letter from Mr. Olsen to Mr. Meshaw, and Exhibits:

Exhibit 1. July 2, 1999, letter from Mr. Olsen to Mr. Meshaw

Exhibit 2. March, 1999 Position Paper.

**Corps Response:** We responded to Mr. Olsen's letter of October 20, 1999 by our letter of December 2, 1999. Both letters are in attachment 1 to this FONSI.

**BPMHLL Comment 2** (Start of Mr. Olsen's letter of August 16, 1999, page 1, paragraphs 1 and 2): As the coastal engineering representative of the Village of Bald Head Island, I would like to bring to your personal attention, a pending issue which you have inherited in your assumption of command of the Wilmington District, COE. Specifically, the matter involves the Ocean Bar Channel Realignment which is a work element of the proposed improvements to the Wilmington Harbor Navigation Project.

Bald Head Island is the coastal barrier island most proximate to the outer channel realignment and will initially suffer a loss of 6 to 8Mcy of beach quality material from its sand sharing system as a result of project implementation. Construction of the realigned channel and its future maintenance are therefore expected to adversely affect Bald Head Island's two abutting shorelines. Several recent submittals related



to this issue have been made to the Wilmington District reflecting the Village's request for both initial and long-term mitigation. The Village is likewise seeking prioritization in the sequence of work required to dredge the outer channel realignment. Although your staff is knowledgeable of both the Village's public position and intentions regarding actions potentially necessary to protect their interests, we think that you may want to personally avail yourself of various facts which could necessitate the Village formally intervening with project construction.

**Corps Response:** Approximately 5.6 million cubic yards of beach quality sand will be removed from the navigation channel during the initial construction of the ocean bar entrance channel to Wilmington Harbor. This sand will be placed along the nearby beaches as described in the sand management plan attached to the environmental assessment. There is insufficient evidence to support the claim that the navigation project has adversely affected the Bald Head Island shoreline or the sand management system. Therefore long term mitigation is not warranted. However, we have committed to placing sand removed during normal maintenance cycles onto the beaches of Bald Head Island and Caswell Beach in accordance with the monitoring plan attached to the Environmental Assessment. We have agreed to designate Bald Head Island as the first order of work in the construction contract involving the removal of sand for the navigation channel.

**BPMHLL Comment 3** (Mr. Olsen's letter of August 16, 1999, page 1, paragraph 3): A continuing concern is that the Project Management Branch of the Wilmington District may not fully appreciate the Village's position in this regard. As of this date, Project Management is procedurally addressing the Village's requirements solely as an element of the Brunswick Beaches Consortium -- irrespective of Bald Head Island's unique physiographic relationship to the entrance channel and the Village's express request for direct consideration as an affected party. For example, it is generally agreed that Bald Head Island has been adversely impacted historically by the maintenance of the navigation channel at its present location. More importantly, it is relatively clear that impacts to the island's sand sharing system will be significant and far reaching with the pending realignment of ocean channel segment.

**Corps Response:** Since the navigation channel has the potential to affect all the nearby beaches and since Bald Head Island is a member of the Brunswick Beaches Consortium, it is more effective to discuss project implementation as a group. Be assured that during the shoreline impact analyses that Bald Head Island was given due consideration. The behavior of the beaches of Bald Head Island and Caswell Beach has been documented by various engineering and geological studies conducted by the Corps of Engineers, universities, private consultants, and others. In addition the North Carolina Division of Coastal Management has a program of updating shoreline change rates for the entire state every 5 years. The results showed insufficient data to support the claim of adverse impact. This information was used in the shoreline impact analyses, and will continue to use this information to establish the expected future behavior of the shorelines following completion of the project. Initial construction and future maintenance operations of the Wilmington Harbor navigation project will be conducted in accordance with the Sand Management and Monitoring Plans. This should adequately address the concerns of effects of the sand sharing system.

**BPMHLL Comment 4** (Mr. Olsen's letter of August 16, 1999, page 2, paragraph 1): Accordingly, the Village of Bald Head Island has initiated measures to ensure its future protection. As a part of that effort, we have made several detailed submittals to the District as part of the EA process for purposes of

developing a record. Copies of those submittals are attached for your personal review. We would appreciate your assistance in this matter and future guidance needed to ensure project success on all counts.

**Corps Response:** Noted.

**BPMHLL Comment 5** (Mr. Olsen's letter of July 21, 1999, page 1, paragraphs 1 and 2): This letter is submitted to the District on behalf of the Village of Bald Head Island and constitutes a second response to your Request-For-Comments dated June 22nd, 1999 regarding the above-referenced project improvements. This information serves to augment both our comments dated July 2, 1999 (see Exhibit No. 1) and a "Position Paper" dated March, 1999 (see Exhibit No. 2). The comments presented herein address both the selected entrance channel alignment, which will directly impact the existing Bald Head Island shoreline, and our ongoing request to the District regarding long-term project mitigation, appropriately placed beach disposal, and the placement of sand at Bald head Island during sea turtle nesting season of Year 2000. Accordingly, please consider the following additional information submitted to the file:

The proposed entrance channel realignment proposes to excavate well in excess of 6M cy of high quality sand from the existing sand sharing system directly seaward of Bald Head Island (BHI). For purposes of discussion, the latter can be considered to be all offshore portions of the seabed eastward of the existing Wilmington Harbor entrance channel centerline. In addition, project construction will remove several million cubic yards of "mixed quality" sand, (i.e., materials with greater than 10% fines) from existing shoals directly seaward of BHI.

**Corps Response:** Noted.

**BPMHLL Comment 6** (Mr. Olsen's letter of July 21, 1999, page 1, paragraph 3 and page 2, paragraph 1): It is reliably predicted that the adjacent shoal system seaward of BHI will adjust to the new channel alignment -- thereby resulting in the requirement for the continued removal of sand by maintenance dredging from the channel fairway as well as from project wideners. Within the first 10 years, or more following entrance channel reconfiguration, the continuing loss of material from the BHI sand sharing system due to maintenance will be significant.

It is the position of the Village of Bald Head Island that the cumulative removal of material from the adjacent seaward sand-sharing system of Bald Head Island must be adequately mitigated by the project sponsor and the Wilmington District, COE.

**Corps Response:** The project maintenance will be conducted and sand will be returned to the area beaches as described in the Sand Management and Monitoring Plans. There is insufficient evidence to support the claim that the navigation project has adversely affected the Bald Head Island shoreline or the sand management system. Therefore long term mitigation is not warranted

**BPMHLL Comment 7** (Mr. Olsen's letter of July 21, 1999, page 2, paragraphs 2 and 3): A 2nd source of anticipated impact to Bald Head Island as a result of entrance channel construction is a modification of alongshore littoral transport potential. Although the District staff is performing analyses of this phenomenon, it is acknowledged that it's quantification is often difficult - particularly, with the type of

bathymetric conditions under consideration. Hence, predicted positive or negative changes in littoral transport potential often result in non-conclusive opinions regarding impacts, or the lack thereof.

It is the position of the Village of Bald Head Island that any identification of project related mitigation predicated solely upon variations in littoral transport at BHI will be unacceptable. The Village will be satisfied with nothing less than mitigation based upon readily identified and easily quantified sediment budget impacts as discussed above.

**Corps Response:** Our analyses do not indicate mitigation is warranted however, future maintenance will see sand returned to the beaches and the long term monitoring plan will have the flexibility to adjust sand placement if required.

**BPMHLL Comment 8** (Mr. Olsen's letter of July 21, 1999, page 2, paragraphs 4 and 5): The impinging hydraulic flow of the existing navigation channel along West Beach at BHI is considered to be a factor contributing to existing shoreline erosion at that location. Proposed channel modifications within the Jay Bird shoals segment of work could exacerbate existing West Beach impacts by way of increased flow magnitude. Moreover, the reorientation of the channel seaward of BHI from sta. 90+00 seaward could result in a meander phenomenon type impact along the West Beach shoreline between sta. 0+00 and sta. 60+00. The District has not performed any level of numerical hydrodynamic modeling to address such impacts.

It is the position of the Village of Bald Head Island, that the District must recognize, monitor and directly mitigate, as necessary, any reconfiguration of the West Beach shoreline resulting from entrance channel reorientation. Such mitigation could potentially require structures necessary to restrict channel migration in the future.

**Corps Response:** We are not aware of a model that can do this. If you can provide such a model, we will review its potential. There is insufficient evidence to support the claim that the navigation project has adversely affected the Bald Head Island shoreline or the sand management system. Therefore long term mitigation is not warranted. However, we have committed to placing sand removed during normal maintenance cycles onto the beaches of Bald Head Island and Caswell Beach in accordance with the monitoring plan attached to the Environmental Assessment. The effects of this maintenance scenario will be monitored and adjustments can be made in accordance with this EA.

**BPMHLL Comment 9** (Mr. Olsen's letter of July 21, 1999, page 2, paragraph 6 and page 3, paragraph 1): It is relatively clear that no landform adjacent to the Wilmington Harbor Entrance Channel has been more adversely affected over time than BHI. Similarly, it is reasonable to assume that due to the reorientation of the entrance channel from sta. 90+00 seaward, BHI will experience substantial immediate and long term impacts to its sand sharing system. Hence, the timing of beach disposal operations at Bald Head is extremely important with respect to the mitigation of project impacts.

It is the position of the Village of Bald Head Island that the Wilmington District should initiate a contract sufficient to allow for beach disposal at Bald head Island at as early a date as possible during Year 2000. It is the opinion of the Village that a favorable Section 7 Consultation can be achieved in order to sufficiently protect sea turtle nesting at Bald Head Island during summer construction. The Village has volunteered to assist the District in this regard.

**Corps Response:** There is insufficient evidence to support the claim that the navigation project has adversely affected the Bald Head Island shoreline or the sand management system. Therefore long term mitigation is not warranted. However, we have committed to placing sand removed during normal maintenance cycles onto the beaches of Bald Head Island and Caswell Beach in accordance with the monitoring plan attached to the Environmental Assessment. The effects of this maintenance scenario will be monitored and adjustments can be made in accordance with this EA. The Corps will initiate a contract for beach disposal as soon as possible, and consultation under the Endangered Species Act has been completed.

**BPMHLL Comment 10** (Mr. Olsen's letter of July 21, 1999, page 3, paragraphs 2, 3 and 4): The Wilmington District has formulated a tentative broad-based, countywide beach disposal program utilizing the 8M cy+ of beach quality sand to be excavated as a result of the Entrance Channel improvements. As discussed above, the vast majority of that sand will be derived solely from the sand sharing system of BHI and as such must be ultimately mitigated for (by the District and the project sponsor) at that location.

Although the Village of Bald Head Island is a contributing member of the BBC, neither the potential lack of fiscal resources nor the global interests of that entity, or its individual members, should influence in any way the Wilmington District's beach disposal scheduling or mitigation requirements for Bald Head Island. The Village of BHI has the resources, expertise and intentions of assisting the District in the construction of a suitably sized beach disposal project at as early a date as possible next year. Based upon the total length of shoreline along South Beach and West Beach at BHI subject to sand placement, the District proposal of an initial disposal of 1.5M cy of sand at that location is considered to be insufficient to meet current needs and potential near term impacts of entrance channel realignment.

The Village of Bald Head Island does not object to the initial construction of beach disposal projects at other Brunswick County locations which seek to maximize public benefits associated with channel construction. It is the position of the Village of BHI, however, that such disposal efforts must not reduce the direct mitigation commitments which need to be obligated at BHI for purposes of addressing both project construction and future maintenance.

**Corps Response:** Based on our shoreline analyses, maintenance distribution will be carried out in a manner to provide a ratio of 2 cubic yards of sand to Bald Head Island for every 1 cubic yard of sand placed on Caswell beach over a six year cycle. Since the navigation channel has the potential to affect all the nearby beaches and since Bald Head Island is a member of the Brunswick Beaches Consortium, it is more effective to discuss project implementation as a group. Be assured that during the shoreline impact analyses that Bald Head Island was given due consideration. There is insufficient evidence to support the claim that the navigation project has adversely affected the Bald Head Island shoreline or the sand management system. Therefore long term mitigation is not warranted. However, we have committed to placing sand removed during normal maintenance cycles onto the beaches of Bald Head Island and Caswell Beach in accordance with the monitoring plan attached to the Environmental Assessment.

**BPMHLL Comment 11** (Mr. Olsen's letter of July 21, 1999, page 3, paragraph 5): As of this date, the Village is laboring under the assumption that the Environmental Assessment (EA) and other studies, or analyses, being prepared by the Wilmington District, COE will both adequately and equitably address the

mitigation requirements of BHI. Those mitigation considerations should address a Beach Disposal Plan at that location which obligates both an adequately sized initial effort as well as the continued disposal of future maintenance material that consists of sand, at no cost to local interests.

**Corps Response:** The behavior of the beaches of Bald Head Island and Caswell Beach has been documented by various engineering and geological studies conducted by the Corps of Engineers, universities, private consultants, and others. In addition, the North Carolina Division of Coastal Management has a program of updating shoreline change rates for the entire state every 5 years. The results showed insufficient data to support the claim of adverse impact. This information was used in the shoreline impact analyses, and will continue to use this information to establish the expected future behavior of the shorelines following completion of the project.

**BPMHLL Comment 12** (Mr. Olsen's letter of July 21, 1999, page 4, paragraph 1): Without an appropriate finding and adequate assurances required to provide comprehensive project mitigation at BHI, the Village will consider legal recourse to protect its interests. Although it is not our intent, such legal action could unfortunately delay the proposed entrance channel improvement project.

**Corps Response:** Noted.

**BPMHLL Comment 13** (Mr. Olsen's letter of July 2, 1999, Exhibit No. 1): The text of this letter is in attachment 1.

**Corps Response:** We will work with Bald Head Island to place sand on the West and South Beaches to the extent possible. The amount of sand is limited to that dredged from the navigation channel and agreements with the State of North Carolina and the Brunswick Beaches Consortium. We are working with Bald Head Island on the exact location of the sand placement. We can place material above the mean high water line providing sufficient easements to do so is obtained in advance. Consultation under the Endangered Species Act regarding sea turtles has been completed.

**BPMHLL Comment 14** (Position Paper, Village of Bald Head Island, March, 1999, Exhibit No. 2): The text of this position paper is in attachment 1.

**Corps Response:** The behavior of the beaches of Bald Head Island and Caswell Beach has been documented by various engineering and geological studies conducted by the Corps of Engineers, universities, private consultants, and others. In addition the North Carolina Division of Coastal Management has a program of updating shoreline change rates for the entire state every 5 years. The results showed insufficient data to support the claim of adverse impact. This information was used in the shoreline impact analyses, and will continue to use this information to establish the expected future behavior of the shorelines following completion of the project. Sand from the initial construction of the Wilmington Harbor navigation channel improvements will be placed on the shores of Bald Head Island, Caswell Beach, Oak Island, and Holden Beach as detailed in the Sand Management Plan attached to the EA. Sand removed during normal maintenance operations will be placed on the shores of Bald Head and Caswell Beach also as detailed in the Sand Management Plan. Further we have committed to a shoreline monitoring plan (attached to the EA) that will be used to verify our shoreline analyses and would allow us to adjust the Sand Management Plan if required.

**BPMHLL Comment 15** (BHI letter dated March 31, 2000, page 1, paragraph numbered 2, parts A, and part B on top of page 2):

A. August 23, 1999, letter from Kathlyn J. Henson, (formerly) Mayor, Village of Bald Head Island, to Michael F. Easley, Attorney General, State of North Carolina, concerning the Wilmington Harbor Project.

B. August 31, 1999, letter from Robin W. Smith, (formerly) Special Deputy Attorney General, to Mayor Henson. (Ms. Smith is now Assistant Secretary for Environmental Protection, NC DENR.).

**Corps Response:** By letter of June 15, 2000, the North Carolina Division of Coastal Management has concurred with our determination that the proposed action is consistent with the NC Coastal Management Program and local land use plans. Our environmental assessment on the project dated February 2000 and this FONSI comply with the requirements of NEPA.

**BPMHLL Comment 16** (BHI letter dated March 31, 2000, page 2, paragraph numbered 3): January 19, 2000, letter from John N. Morris, to Harry Simmons, Chairman, Brunswick Beaches Consortium, concerning the availability of additional sand.

**Corps Response:** We agree with Mr. Morris' letter.

**BPMHLL Comment 17** (BHI letter dated March 31, 2000, page 2, last two paragraphs): We understand that you already have Mr. Olsen's correspondence. If we need to provide additional copies, please advise. We enclosed the other correspondence.

The second part of the Village's comments we have not yet finished work on. The preparation of those comments has been slowed by our ongoing efforts with the project sponsors to resolve certain issues about sand management in the Wilmington Harbor project. As we have reported to project sponsor representatives, we expect to be in a position shortly to submit the second part of the Village's written comments. We will submit them as soon as possible, but no later than April 10, 2000.

**Corps Response:** Noted.

## **11.00 ENVIRONMENTAL COMMITMENTS:**

The environmental goal of this project is to avoid and minimize adverse impacts to the extent practicable. Therefore, construction and maintenance activities will be conducted as described in the February 2000 EA and the commitments in this FONSI. These Commitments have been divided into four areas: Blasting, Dredging, Beach Disposal, and Fish Passage At Lock And Dam 1, Cape Fear River.

**BLASTING** – These activities will be conducted **during** construction only

- Each charged hole will be stemmed to suppress the upward escape of blast pressure from the hole,
- A delay will be used for each hole to prevent cumulative blasting impact for each set of holes,
- Scare charges will be conducted for each blast to attempt to keep organisms from the blast site,



- Blast pressures will be monitored and upper limits will be imposed on each series of 5 blasts. The average peak pressure shall not exceed 70 pounds per square inch (psi) at a distance of 140 feet. The maximum peak pressure shall not exceed 120 psi at a distance of 140 feet.
- Blasting will be restricted to the NC Division of Marine Fisheries window of August through January.
- Sinking gill nets will be set for duration of 3 hours prior to a blast. The nets will surround the blast area as much as feasible, and will not be removed sooner than 1 hour before the blast. Any sturgeon captured will be released in the Brunswick River. The nets will be manned continuously and if a marine mammal or sea turtle is observed nearby then the nets will either not be set or retrieved if already set. In addition the nets will have floats with reflective tape that extend to the surface. If these floats indicate that a large animal has become entangled, the nets will be immediately retrieved and the animal released. Nets set in the dark (0.5 hour or more before sunrise) prior to any early morning blast (blast can't occur within 2 hours of sunrise), will require monitoring the surface water and net floats with night vision equipment, and using hydrophones to monitor for the presence of dolphin. No overnight sets are allowed.
- Channel nets will be set down current of the blast area 10 minutes prior to each blast and left in place for at least an hour in order to capture and document dead or injured fish.
- Vessel and aerial surveys for sea turtles, manatees, and dolphins/porpoises will be conducted for 1 hour before and 1/2 hour after each blast. If any of these species are observed within a specified danger zone, blasting will be delayed until they voluntarily leave. The danger zone will extend 3,500 feet from the blast site. Noise levels will be monitored at 3,500 feet to assure that they do not exceed 178 dB re 1uPa, and the protective radius will be increased (in 500-foot increments) if monitoring indicates this is necessary to meet the noise limit.
- Surveillance for schools of fish will be conducted by vessels with sonar fish finders for a period of 20 minutes before each blast, and if fish schools are detected, blasting will be delayed until they leave. The surveillance zone will be approximately circular with a radius of about 500 feet extending outward from each blast set.
- Due to the uncertainties of the potential impacts of the proposed blasting plan on larval fishes, some additional monitoring is justified. The Corps will address these issues through the development of a monitoring plan that will be developed through coordination with all interested agencies or individuals, and it should be implemented by the fall of 2000.

**DREDGING** - These activities will be conducted **during** construction only.

- Dredging actions will include overflow of hopper dredges, or scows and barges used with either hydraulic pipeline or bucket dredges. Monitoring of the overflow plume would be done for channels where sediment is less than 90% sand and PNAs are adjacent to the channel (i.e. designated PNAs beginning 300 yards from the navigation channel). The monitoring plan was included in Appendix C of the EA. No overflow is proposed in areas where PNAs are contiguous with the navigation channel.
- Upstream of Reaves Point Channel, hydraulic dredging will be restricted to the NC Division of Marine Fisheries window of August through January.

**BEACH DISPOSAL** - These activities will be conducted **before, during, and/or after** construction.

- Due to the uncertainties of the potential impacts of disposal of sand on the beach year-round, some additional monitoring is justified. These uncertainties concern beach disposal impacts on sea turtles, larval and juvenile fishes, shorebirds, and surf zone invertebrates. The Corps will address these issues through the development of an integrated monitoring plan. This plan will be developed through coordination with all interested agencies or individuals, and it should be implemented by the fall of 2000.
- Critical wintering habitat for piping plover has been proposed by the US Fish and Wildlife Service under the Endangered Species Act (ESA) for several North Carolina Beaches. If beach disposal is planned in any of these areas, the disposal will either be eliminated or approval for disposal will be sought under the ESA.
- In the beach disposal areas, elevation profiles will be performed at 500-foot intervals twice a year (spring and fall) from the back toe of the dune to wading depth. In the same area, in water profiles will be taken at 1,000 foot intervals once a year to coincide with the spring onshore survey. The profiles will be from the beach out a distance of 15,000 feet or a depth of 25 feet whichever is encountered first. Vertical aerial photographs will be taken every year generally near the time of the spring profile survey.
- After placement of dredged material on the beaches and prior to the first turtle-nesting season, the beaches will be monitored for compaction. The beach will be monitored for escarpment formation prior to each nesting season. If the beach hardness exceeds 500 cone penetrometer units, the beach will be tilled. If an escarpment exceeds 18 inches, then it will be leveled.
- From May 1 through November 15, all lighting on the beach associated with project construction shall be minimized to the maximum extent practicable while maintaining compliance with all safety requirements. Reduced wattage and special fixtures or screens to reduce illumination of adjacent beach and near shore waters shall be used if practical.
- From May 1 through November 15, construction pipes that are placed parallel to the shoreline will be placed as far landward as possible when passing over completed sections of the project. Temporary storage of pipes and equipment shall be off of the beach.

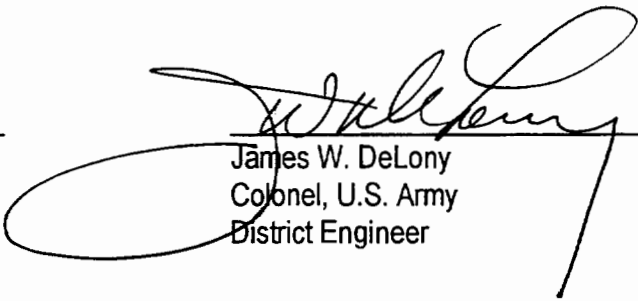
**FISH PASSAGE AT LOCK AND DAM 1, CAPE FEAR RIVER -** These activities will be conducted during construction.

- The Wilmington District Corps of Engineers and the Wilmington Harbor Project Sponsor, State of North Carolina have agreed to construct a fish passage structure at Lock and Dam 1 on the Cape Fear River. This is the most downstream structure blocking fish passage on the river, and successful passage of fish over Lock and Dam 1 will open up about 32 miles of the main stem of the Cape Fear River to anadromous and other fishes. Additional investigations are required to determine the final design, but construction will probably consist of a rock rubble structure or similar feature. The design will not change any authorized project purposes such as operation of the lock or change the crest elevation of the pool behind the dam. The pool elevation is critical to protect the upstream water supply intake for the Lower Cape Fear Water and Sewer Authority and the City of Wilmington from salt-water intrusion. All interested agencies and experts will be involved in developing the best design for the fish passage structure. Our goal is to start design activities early in the summer of 2000 and start construction in the summer of 2001. Funds for this project will come from the Wilmington Harbor Project. Following construction, monitoring will be conducted to determine how effective the structure is in passing fish.

- We also commit to obtaining funds to study the best fish passage design for Lock and Dams 2 and 3 further upstream. Before a design would be proposed for these structures, the monitoring results for at least one spring from Lock and Dam 1 would need to be reviewed by all interested parties. In addition, Lock and Dams 2 and 3 do not provide protection for saltwater intrusion, so a potential fish passage alternative is removal of the structures. Such removal would change the project's authorized purposes since the lock would no longer be able to operate. Any project deauthorization would require approval by congress. Therefore, any structural modifications to Lock and Dams 2 and 3 could take several years.

**12.00 FINDING OF NO SIGNIFICANT IMPACT:** All comments received on the EA have been resolved either through providing additional information or agreeing to develop an appropriate monitoring plan where justified. In addition, all required environmental clearances to conduct the proposed action have been obtained. Therefore, I conclude that the proposed action will not significantly affect the quality of the human environment and an environmental impact statement will not be prepared.

Date: 11 Aug 00



James W. DeLony  
Colonel, U.S. Army  
District Engineer

Attachment

**ATTACHMENT 1**

**LETTERS RECEIVED DURING THE COMMENT PERIOD ON THE EA**



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office  
9721 Executive Center Drive N.  
St. Petersburg, Florida 33702  
(727) 570-5317, FAX 570-5300

March 15, 2000 F/SER4:RS:am

Action: TS  
CF: PM

Colonel James W. DeLony  
District Engineer, Wilmington District  
Department of the Army, Corps of Engineers  
P. O. Box 1890  
Wilmington, North Carolina 28402-1890

Dear Colonel DeLony:

The National Marine Fisheries Service (NMFS) has reviewed the Environmental Assessment (EA) for Preconstruction Modifications of Authorized Improvements, Wilmington Harbor, North Carolina, dated February 2000. This Federal project connects deep water of the Atlantic Ocean with port facilities in Wilmington by way of a 37-mile-long channel in the Cape Fear and Northeast Cape Fear Rivers. Eighteen months of continuous dredging is proposed to relocate the existing channel. About 3.9-million cubic yards of beach quality material generated by this work would be placed on the Brunswick County beaches and about 2.1-million cubic yards of dredged material would be placed on New Hanover County beaches. Any excess material that is not beneficially used (e.g., placement in the old ocean bar channel) or not placed into existing disposal areas, will be disposed in the Offshore Dredged Material Dump Site (ODMDS). The work would require five to seven years to complete and the Corps of Engineers (COE) estimates that the project would save about \$5.25 million.

Our review of the EA, coordinated with the National Oceanic and Atmospheric Administration, National Ocean Service, Center for Coastal Fisheries and Habitat Research (CCFHR) has identified the following unresolved issues, additional information needs, and comments for your consideration.

General Comments

The EA does not adequately address project-related impacts to NMFS trust fishery resources and essential fish habitat (EFH) for Federally managed species. The sections of the document that address EFH do not include the surf zone as an impacted category of EFH. The South Atlantic Fishery Management Council has identified the surf zone as EFH for white shrimp, black sea bass,





cobia, lane snapper, red drum and Spanish mackerel.<sup>1</sup> The EA also does not adequately address the impacts to the various life history stages of other estuarine-dependent fishery resources found in the surf zone and nearshore waters. The discharge of dredged material in these areas could adversely impact early life stages of species that accumulate along the beach front prior to their movement into the Cape Fear River to reach upstream primary nursery areas (PNA).

The potential impacts of this project on fishery resources is exacerbated by the multitude of private and Federal projects proposing beach nourishment or nearshore disposal of dredged material, hurricane protection, or the beneficial use of dredged material generated by maintenance of Federal navigation projects. However, insufficient information is available to adequately address the impacts of beach nourishment on various life stages of fishery resources that utilize the surf zone as habitat.<sup>2</sup> Accordingly, the EA should be revised to more completely address the limits of our understanding of the impacts to fishery resources associated with the discharge of dredged material on or just offshore of ocean beaches. The EA should also include a plan to monitor impacts to early life stages of fish in the surf zone. Without a better understanding of this issue, adverse impacts to EFH could be underestimated for this and future projects involving beach nourishment.

NMFS also is concerned that the EA inadequately addresses the impacts on larval fish of blasting for rock removal in the upper Cape Fear River. We have previously identified this as an important category of impact for which limited data are available. Air bubble curtains were proposed in the original plans to ameliorate the impacts of blasting on fishery resources. However, the study of the bubble curtains (Appendix B) concluded that they were ineffective in reducing mortality in the early life stage of selected fishes. As a result, their use is removed from the modified project plans resulting in a savings of about \$20 million. We concur with the COE's decision not to use bubble curtains. However, the EA should be revised to address the impacts of blasting on larval fish more thoroughly and provide a basis for the determination that this impact is not expected to be significant.

Seasonal restriction on blasting and blast pressure limits are incorporated into the project to mitigate the impacts of blasting. However, larvae and juveniles of Federally managed species such as red drum are present in the estuarine water column during the period when blasting is allowed. Furthermore, blasting will occur close to the PNAs that are located in the upper reaches of the Cape Fear River. Because the effectiveness of controlling blast pressures to reduce impact to larvae is

---

<sup>1</sup>South Atlantic Fishery Management Council. 1998. Final habitat plan for the South Atlantic region: Essential Fish Habitat requirements for Fishery Management Plans of the South Atlantic fishery Management Council. South Atlantic Fishery Management Council. Charleston, SC.

<sup>2</sup>Hackney, C. and S. Ross. 1996. A review and synthesis of data on surf zone fishes and invertebrates in the South Atlantic Bight and the potential impacts from beach nourishment. Report to the U.S. Army Corps of Engineers, Wilmington, N.C. 111pp.

untested, there is no way to ascertain that this measure will avoid or minimize impacts to fish. We recommend that the EA be revised to include a monitoring and research plan to improve the understanding of the magnitude and scope of impacts on larval fish and to evaluate the effectiveness of the COE's strategy to use blast pressure controls as a protective measure.

The EA provides a comprehensive plan for utilization of all approved types of dredging equipment and dredged material disposal alternatives. The goal is to improve efficiency and flexibility in dredging and disposal of dredged material to reduce project cost. One aspect of the plan is to eliminate the seasonal restriction on dredging in the Ocean Bar II Contract (OBIIC) area. We cannot support this proposal unless a more geographically and seasonally limited restriction is imposed. Specifically, the EA should be revised to address an alternative seasonal restriction that would prohibit dredging in January, February, and March for the Smith Island reach of the OBIIC area. Avoiding dredging in this portion of the OBIIC area during the late winter and early spring would avoid potential impacts to larvae of estuarine-dependent species and adult anadromous fish that are migrating into the river during this period.

#### Specific Comments

##### 1.00 PURPOSE AND NEED FOR ACTION

##### 1.04.2 Beneficial Use of Project-derived Sand.

Page 5, paragraph 1. The Fish and Wildlife Service indicates that there is a high mud content throughout most of the offshore project area and in the two disposal islands proposed for pump out to New Hanover County beaches. There were no core samples taken between stations 0+00 and 120+00 of Baldhead Shoal Channel, the section where sediments will be used for beach disposal. While other data suggests that this material will be beach compatible, the EA contains no supporting data. The EA assumes that all of the sediment from this reach will be beach suitable, while currently available data suggest that might not be the case. Furthermore, there were no samples taken seaward of station 190+00 to document whether sediments from this point seaward are beach suitable materials. This includes the section of the new channel that runs through the ODMDS where beach suitable material has been dumped in the past. The EA should be revised to address these issues. Site specific information regarding the sediment grain size and availability of acceptable disposal alternatives must be identified for all portions of the project.

##### 1.04.5 Use of Blast Pressure Limits Instead of Air Bubble Curtains to Protect Aquatic Life.

Page 8, paragraph 6. A number of measures designed to reduce the impact of blasting on aquatic resources are addressed in this section. However, the magnitude of impacts to larval fish during the period when blasting is allowed, remains unresolved. We recommend further consideration of directed research to quantify the scope and magnitude of impacts and provide an evaluation of the effectiveness of the plan to impose blast pressure limits to mitigate impacts.

### 3.00 ALTERNATIVES

#### 3.02 Disposal Alternatives for Dredged Sand.

Page 16, paragraph 3. The spatial extent of the beach disposal activities for the New Hanover and Brunswick County beaches is not provided in the EA. The exact quantity of beach quality dredged material has not been determined and negotiations are on-going regarding economic, programmatic, and environmental priorities for beach nourishment. We understand that additional information will be provided when the results of ongoing sediment analyses become available and coordination with the state and local governments representing area beaches is completed. We recommend that the EA be revised to include a commitment to provide a supplemental document that addresses in detail the exact location of sand sources, beach disposal sites, and the proposed schedule for disposal for both the construction phase and maintenance of the project. This information will provide missing detail on the area and magnitude of impact.

### 4.00 AFFECTED ENVIRONMENT

#### 4.04 Marine and Estuarine Resources.

Page 20, paragraph 2. The surf zone is described in this section as providing important fish habitat. However, the description does not identify it as EFH for Federally managed species. This section should be expanded to address the full list of species and their life stages that are found throughout the year in the surf zone or just offshore. A complete characterization of fishery resources in the surf zone is important because this is the aquatic habitat most directly effected by beach nourishment.

### 5.00 ENVIRONMENTAL IMPACTS

#### 5.01 Geology and Sediments.

##### Impacts of Beach Placement of Dredged Sand.

Page 27, paragraph 6. This section should acknowledge that alterations of the physical environment in the surf zone may adversely impact fishery resources.

##### Impacts on Hardbottom.

Page 28, paragraph 5. Kure Beach's coquina outcrops are not listed in the hardbottoms discussion and neither are hardbottoms off Oak Island. Both these areas are EFH and within the "active littoral zone." The COE claims on page 28 that all hardbottoms are seaward of the littoral zone is incorrect and should be revised. The discussion of impacts to hardbottoms also does not address turbidity as a potential source of impact from dredging of the new channel, backfilling the old channel, transporting overfilled barges, scows, and hoppers to and from the beach, and the washing of fine sediments off the beach onto nearshore hardbottoms. The EA, therefore, should be revised to address these potential impacts to hardbottoms which are designated as EFH.

#### 5.04 Marine and Estuarine Resources.

##### Blasting Impacts.

Page 32, paragraph 4. We disagree with the conclusion that, "some mortality of fishes may occur close to each blast," but "the number affected is not expected to be large, and this impact is not expected to be significant." Insufficient data are available on the impacts of blasting on larval fish to reach this conclusion. In addition, there is no plan in the EA to evaluate the effectiveness of the blast pressure limits that the COE proposes to minimize impacts. Because Federally managed species such as red drum would be impacted, the finding in this section of the EA should be re-evaluated.

#### 5.05 Essential Fish Habitat

Page 35, paragraph 2. The surf zone is not included in the list of EFH habitat categories in this section and in Table 8. The surf zone should be added because it is the area most likely impacted by the proposed disposal of dredged material on up to 14.97 miles of beach. In addition, the evaluation of impacts should consider the full range of species and life stages of fishery resources that utilize this habitat.

##### Impact Summary for Essential Fish Habitat.

Page 38, paragraph 3. We disagree with the conclusion that the proposed action is not expected to cause adverse impacts to EFH. As noted above, beach disposal of dredged material and blasting for rock removal could impact the surf zone and the hard bottom categories of EHF and the Federally managed resources they support.

#### 5.14 Cumulative Impacts.

Page 43, paragraph 3. The extent to which this project will add to the cumulative impacts of the large number of projects involving beach altering activities along the North Carolina coast should be addressed. Furthermore, the discussion of cumulative impacts does not consider the Brunswick County Beaches Nourishment Project (scheduled for 2004-2005) which will occur only two to three years after beach disposal associated with the construction phase of this project is completed. NMFS does not agree that cumulative impacts to the beach strand ecosystem are short-term, minor, or negligible. The EA should be revised accordingly.

The paucity of information on the impacts of beach nourishment and blasting on fishery resources, especially early life stages, warrants that directed monitoring and research would be beneficial in quantifying the magnitude and scope of project impacts. The enclosed memo from the CCFHR provides a brief overview of the types of studies that could address the impacts of beach nourishment and rock blasting on early life stages of fishery resources. If the above concerns are

not resolved, the NMFS cannot concur with a Finding of No Significant Impact for the project and in accordance with the National Environmental Policy Act implementing regulations from the Council on Environmental Quality, Section 1502.9(c)(1) must recommend that a supplemental Environmental Impact Statement be prepared.

Based on our review of the EA and assessment of potential adverse impacts to fishery resources in general, Federally-managed fishery resources, and EFH, the final project design should incorporate measures to ensure that impacts can be quantified and mitigated. Accordingly, NMFS recommends that mortality of early life stages of fishes associated with the blasting necessary for channel excavation should be quantified and any significant impacts should be mitigated. Further, channel dredging in the Smith Island reach of the OBIIC should be scheduled to avoid work from January through March. This is a period of peak biological activity and when anadromous fishes migrate through the project area. The following recommendations also are provided pursuant to requirements of the Magnuson-Stevens Fishery Conservation and Management Act.

#### **EFH CONSERVATION RECOMMENDATIONS**

1. The project should be designed to avoid adverse impacts to surf zone habitats and associated fisheries. Otherwise, measures must be specified to offset the adverse impacts.
2. Measures necessary to compensate for unavoidable adverse impacts to EFH should be coordinated with the NMFS and incorporated as components of the overall project design and budget.

We appreciate the opportunity to provide these comments. If you have any questions, please direct them to Ronald Sechler at (252) 728-5090.

Sincerely,

A handwritten signature in dark ink, appearing to read 'Andreas Mager, Jr.', with a stylized, flowing script.

Andreas Mager, Jr.  
Assistant Regional Administrator  
Habitat Conservation Division

Enclosure

cc:

FWS, ATLA, GA

FWS, Raleigh, NC

EPA, ATLA, GA

NCDENR, Raleigh, NC

NCDENR, Morehead City, NC

F/SER41

SAFMC

PSP - Fructer





**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office  
9721 Executive Center Drive N.  
St. Petersburg, Florida 33702  
(727) 570-5317, FAX 570-5300

March 15, 2000 F/SER4:RS:am

Colonel James W. DeLony  
District Engineer, Wilmington District  
Department of the Army, Corps of Engineers  
P. O. Box 1890  
Wilmington, North Carolina 28402-1890

Dear Colonel DeLony:

The National Marine Fisheries Service (NMFS) has reviewed Public Notice CESA W-TS-PI-00-65-0003 and Notice of Availability of the Environmental Assessment (EA) for the Preconstruction Modifications of Authorized Improvements, Wilmington Harbor, North Carolina, dated February 24, 2000. This Federal project connects the deep waters of the Atlantic Ocean with port facilities at Wilmington by way of a 37-mile-long channel along the Cape Fear River and Northeast Cape Fear River. Previously authorized harbor improvements include deepening the navigation channel generally by four feet and widening portions of the project.

The modified project consists of a variety of changes including eighteen months of continuous dredging to relocate the existing ocean bar channel. The Corps of Engineers (COE) estimates that continuous dredging, rather than seasonally restricted dredging, will save about \$5.25 million. About 3.9-million cubic yards of beach quality material generated by this work would be placed on the Brunswick County beaches and about 2.1-million cubic yards of dredged material would be placed on New Hanover County beaches. Any excess material that is not beneficially used (e.g., placement in the old ocean bar channel) or not placed into existing disposal areas (e.g., placement of rock dredge material in the Wilmington Offshore Fish Enhancement Structure) will be disposed in the Ocean Dredged Material Disposal Site. Relocation of the harbor entrance channel will alter 153 acres of bottom habitat; however, the previously authorized plan would have altered 285 acres, including live bottom habitat. The work would require five to seven years to complete.

Our review of the public notice and the EA, coordinated with the Center for Coastal Fisheries and Habitat Research (CCFHR), finds that NMFS trust resources, including essential fish habitat (EFH) designated by the South Atlantic (SAFMC) and Mid-Atlantic (MAFMC) Fishery Management Council, would be adversely impacted by various aspects of the proposal. The project is located in the Atlantic Ocean and the Cape Fear River which are identified as EFH for eggs, larvae, juvenile,



and adult of red drum (*Sciaenops ocellatus*), bluefish (*Pomatomus saltatrix*), cobia (*Rachycentron canadum*), brown shrimp (*Penaeus aztecus*), pink shrimp (*Penaeus duorarum*), and white shrimp (*Penaeus setiferus*). In addition, EFH for larvae, juvenile, and adults of summer flounder (*Paralichthys lethostigma*) and black sea bass (*Centropristis striata*); juveniles of gag grouper (*Mycteroperca microlepis*) and gray snapper (*Lutjanus griseus*); and juveniles and adults of king mackerel (*Scomberomorus cavalla*), Spanish mackerel (*Scomberomorus maculatus*), and spiny dogfish (*Squalus acanthias*) are located in the project area. Categories of EFH potentially impacted by this work include surf zone, marine and estuarine water columns, and mud and sand bottom habitat.

The project area also provides habitat for other commercially and recreationally important species including Atlantic croaker (*Micropogonias undulatus*), spot (*Leiostomus xanthurus*), spotted seatrout (*Cynoscion nebulosus*), Atlantic menhaden (*Brevoortia tyrannus*), and striped mullet (*Mugil cephalus*).<sup>1</sup> These estuarine-dependent species serve as prey for other fisheries managed under the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) by the SAFMC (e.g., snapper grouper complex); the MAFMC (e.g., bluefish, summer flounder, spiny dogfish), and highly migratory marine species managed by the NMFS (e.g., billfish, tuna, and sharks). Detailed information on the above species and other Federally managed fisheries and their EFH is provided in the 1998 amendments of the Fishery Management Plans prepared by the SAFMC and the MAFMC and the highly migratory species amendments prepared by the NMFS. The amendments were prepared as required by the MSFCMA (P.L. 94-265). In addition, many of the above species have been identified in Section 906(e)(1) of the Water Resources Development Act of 1986 (PL 99-602) as species of “national economic importance.”

We are concerned that continuous dredging for eighteen months and the discharge of a maximum of six million cubic yards of dredged material on the New Hanover and Brunswick County beaches would adversely impact fishery resources and EFH for Federally managed species. The surf zone is designated as EFH for white shrimp, black sea bass, cobia, lane snapper, red drum, and Spanish mackerel. Early life stages of other estuarine-dependent fishery resources found in the surf zone and nearshore waters are also at risk.<sup>2</sup> The discharge of dredged material in these areas could adversely impact species that accumulate along the beachfront prior to their movement into the Cape Fear River to reach upstream primary nursery areas (PNA).

The potential impacts of this project on fishery resources is exacerbated by the multitude of private and Federal projects proposing beach nourishment or nearshore disposal of dredged material, hurricane protection, or the beneficial use of dredged material generated by maintenance of Federal

---

<sup>1</sup>Nelson, D.M., E.A. Irlandi, L.R. Settle, M.E. Monaco, and L.C. Coston-Clements. 1991. Distribution and Abundance of Fishes and Invertebrates in Southeast Estuaries. ELMR Rept. No. 9. NOAA/NOS Strategic Environmental Assessments Division, Rockville, MD. 177p.

<sup>2</sup>Lindeman, K.C. 1989. Coastal construction, larval settlement, and early juvenile habitat use of coastal fishes of southeast Florida. Bull. Mar. Sci. 44(2):1068.

navigation projects. However, insufficient information is available to adequately address the impacts of beach nourishment on various life stages of fishery resources that utilize the surf zone as habitat.<sup>3</sup> Without a better understanding of this issue, adverse impacts to EFH could be underestimated for this and future projects involving beach nourishment.

The NMFS also is concerned that blasting for rock removal in the upper Cape Fear River will adversely impact larval fish. We have previously identified this as an important category of impact for which limited data are available. Air bubble curtains were proposed in the original plans to ameliorate the impacts of blasting on fishery resources. However, the study of the bubble curtains concluded that they were ineffective in reducing mortality in juveniles of selected fishes. As a result, their use is removed from the modified project plans. Instead, seasonal restriction on blasting and blast pressure limits are incorporated into the project to mitigate the impacts of blasting. However, larvae and juveniles of Federally managed species such as red drum are present in the estuarine water column during the period when blasting is allowed. Furthermore, blasting will occur close to the PNAs that are located in the upper reaches of the Cape Fear River. Because the effectiveness of controlling blast pressures to reduce impact to larvae is untested, there is no way to ascertain that this measure will avoid or minimize impacts to fish.

A comprehensive dredging and dredged material disposal plan is an important component of the modified project. One aspect of the plan is to eliminate the seasonal restriction on dredging in the Ocean Bar II Contract (OBIIC) area. We cannot support this proposal unless a more geographically and seasonally limited restriction is imposed. An alternative seasonal restriction that would prohibit dredging in January, February, and March for the Smith Island Reach of the OBIIC area would avoid potential impacts to larvae of estuarine-dependent species and adult anadromous fish that are migrating into the river during this period.

Our March 15, 2000, comments on the EA addressed the paucity of information on the impacts of beach nourishment and blasting on fishery resources, especially early life stages. Included was a memo from the CCFHR that provided a brief overview of the types of studies that could address the impacts of beach nourishment, rock blasting, and project related changes in tidal elevations on early life stages of fishery resources. NMFS also advised that based on the review of the EA and assessment of potential adverse impacts to fishery resources in general, Federally-managed fishery resources, and EFH, the final project design should incorporate measures to ensure that impacts can be quantified and mitigated. Accordingly, NMFS recommended that mortality of early life stages of fishes associated with the blasting necessary for channel excavation should be quantified and any significant impacts should be mitigated. Further, channel dredging in the Smith Island reach of the OBIIC should be scheduled to avoid work from January through March. Also provided were EFH recommendations designed to ameliorate EFH impacts. These recommendations remain relevant and are reiterated here for your consideration.

1. The project should be designed to avoid adverse impacts to surf zone habitats and associated

---

<sup>3</sup>Hackney, C., M.Posey, S. Ross, and A. Norris. 1996. A review and synthesis of data on surf zone fishes and invertebrates in the South Atlantic Bight and the potential impacts from beach nourishment. Report to the U.S. Army Corps of Engineers, Wilmington, NC. 111pp.

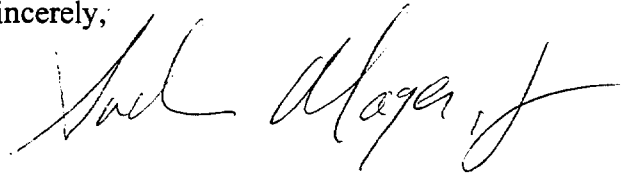
fisheries. Otherwise, measures must be specified to offset the adverse impacts.

2. Measures necessary to compensate for unavoidable adverse impacts to EFH should be coordinated with the NMFS and incorporated as components of the overall project design and budget.

We believe that our concerns warrant additional monitoring and research to quantify the magnitude and scope of fishery impacts associated with fill placement in surf zones and blasting for rock removal. If the above concerns are not resolved, the NMFS cannot concur with a Finding of No Significant Impact for the project as proposed in the EA and, in accordance with the National Environmental Policy Act implementing regulations from the Council on Environmental Quality, Section 1502.9(c)(1), must recommend that a supplemental Environmental Impact Statement be prepared.

We appreciate the opportunity to provide these comments. If you have any questions, please direct them to Ronald Sechler at (252) 728-5090.

Sincerely,

A handwritten signature in black ink, appearing to read "Andreas Mager, Jr.", written in a cursive style.

Andreas Mager, Jr.  
Assistant Regional Administrator  
Habitat Conservation Division

cc:

FWS, ATLA, GA

FWS, Raleigh, NC

EPA, ATLA, GA

NCDENR, Raleigh, NC

NCDENR, Morehead City, NC

F/SER41

SAFMC - Pugliese


MAFMC - Hoff



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
**NATIONAL OCEAN SERVICE**  
Center for Coastal Fisheries and Habitat Research  
101 Pivers Island Road  
Beaufort, North Carolina 28516-9722

13 March 2000

MEMORANDUM FOR: Larry Hardy

FROM: Lawrence Settle 

SUBJECT: Comments on Environmental Assessment: Preconstruction  
Modifications of Authorized Improvements - Wilmington Harbor,  
North Carolina - February 2000

cc: Jon Hare, Gordon Thayer, Dave Peters, Dave Meyer, Ron Sechler,  
Don Hoss

There are three areas of concern relative to potential project impacts on fishery resources:

1) Impacts from beach nourishment; 2) impacts due to blasting; and 3) impacts on Essential Fish Habitat.

### **Beach Nourishment Impacts**

The impact of beach nourishment on larval and juvenile fishes is unknown. This is because, the current state of knowledge on the distribution, abundance and species composition of larvae in the surf zone is very limited. A similar poor level of understanding exists for the use of the surf zone as nursery habitat for juveniles. In fact, the USCOE, Wilmington District, in reference to the construction of a weir jetty at Oregon Inlet, has previously recommended studies to document the abundance, diversity, migration and distribution of larval and juvenile surf zone fishes. Such studies have not been conducted. While studies at other North Carolina inlets have shown very high concentrations of young estuarine-dependant and coastal species, many of which are of substantial commercial and recreation importance, in waters just outside the surf zone along the barrier beaches, we know nothing about their concentrations from mean high water out into the surf zone.

It has been postulated that larvae may pool in near-shore waters prior to moving into inlets on flood tide. From studies conducted at Oregon Inlet, Ocracoke Inlet and Beaufort Inlet we have found that larvae are not equally distributed around the inlet delta or in the pass. Samples collected along the ebb-tide delta in waters ranging from 4.6 to 7.6 m (15 to 25 ft) show that larvae are often abundant at these depths. Larvae tend to be more abundant on the upcurrent approach to inlets indicating that most are poised to enter the inlet from a lateral longshore direction and not via the main navigation channel. Within the inlet throat, we have found that larvae are considerably more abundant along the inlet edge than in mid-channel. Several kilometers offshore from the inlet mouth,





the abundance of larvae is quite variable and probably reflects the movements of discrete patches of larvae.

Although we know that larvae can be abundant in relatively shallow waters near the inlet we do not know their abundance in the surf and near-shore zones of adjacent beaches. Therefore, the impact of beach nourishment on larval ingress cannot be reliably estimated. There is a clear need to determine the distribution of larvae and juveniles in the near-shore environment likely to be impacted by nourishment activities. Additional research should be conducted to determine the distribution and abundance of larval fishes in the near-shore habitat, their relative contribution to the number of larvae which successfully migrate through the inlet and the impact of spoil deposition on mortality. In the absence of such information, potentially significant impacts cannot be ruled out. A carefully designed study to determine near shore gradients of larval concentration and juvenile abundance, before, during and after spoil deposition, is necessary in order to determine the impact of beach nourishment.

### **Blasting Impacts**

The proposed blasting during channel deepening in the upper project area will undoubtedly result in mortality of some organisms. The concern about impacts of blasting on living resources is focused on mortality of fish, turtles and marine mammals. This emphasis is predicated on public interest in these animals and their relatively high sensitivity to pressure changes generated by underwater explosions. While limited numbers of other species which are in close proximity to a blast will be killed, those with gas filled organs (i.e., lungs or swimbladders) are vulnerable at a greater distance. To some extent, blasting mortality can be minimized by not blasting when these animals are not distributed in the affected area, or mortality may be predicted from models based on prior studies. Unfortunately predictions about fish mortality are not very precise for a variety of reasons including primarily: 1) uncertainty about their distribution (i.e., how many individuals will be exposed, at what depth, and at what distance from the blast; 2) species-specific differences in sensitivity; and 3) uncertainty about precision and accuracy of existing models which have been developed from data collected in different ecological systems or conditions. We recommend that blast impacts be monitored based on the concern that current model predictions of mortality are insufficient. Efficient design of a monitoring plan calls for the effort allocated in a manner proportional to the uncertainties inherent in predicting impacts and the management concern about such impacts. Assuming that marine mammal and protected species problems will be dealt with by timing of the blast, the major mortalities of concern will be of fishes.

Models for prediction of lethal impacts on large juvenile and adult fishes are fairly robust; thus, their total mortality can be predicted with reasonable accuracy, provided fish abundance and distribution are known. Unfortunately, the abundance and distribution of late-stage juvenile and adult fishes is both highly contagious. However, if we assume that estimates of the lethal area surrounding the blast are accurate, and that the blast areas are not, for some unknown reason, areas of special concentration (e.g., a migration route) the conclusion that blasting will have no significant adverse impact to these groups of fishes seems reasonable. Estimation of actual blast induced mortality on these populations would be expensive and of little management value. Limited sampling immediately after a few blasts will be sufficient to document the relative size and species composition of observed nekton mortalities.

Impacts on early-life-history stages of fishes should be the focus of monitoring efforts because large numbers of larvae and early post-larval juvenile fishes will be exposed and there is little information from which to predict the magnitude of detrimental effects. Because blasting will occur within a rather narrow migratory pathway for these fishes, a substantial fraction of that area's population may be impacted. The sensitivity of these stages has not been measured. Based on the increased sensitivity with decreasing fish size shown in published models, the blasting impacts may be expected to be large. However, extrapolation to these smaller fishes may not be valid and requires testing.

#### **Impacts on Essential Fish Habitat (EFH): Primary Nursery Areas (PNA)**

Two of the most important factors affecting distribution and composition of estuarine emergent wetlands, an identified EFH, are salinity and tidal range. As a consequence of nekton dependence on these marshes, subtle changes in marsh attributes (e.g., areal coverage, hydroperiod, plant density) can substantially influence fishery production. Due to the predicted project-related increase in tidal range, changes in plant and nekton communities of PNA are expected and may be significant. Change in marsh plant distribution and dominance could alter habitat function and changes in salinity and tidal range may have substantial effects on nekton use. To determine the effect of these changes on the function of these important nursery habitats, it is essential that monitoring be conducted. The monitoring study should be designed to facilitate comparison with existing data from pre-project studies and should include: 1) monitoring the distribution, abundance and species composition of marsh plants and nekton; 2) monitoring the trophic structure of the community to detect shifts in predator-prey interactions; 3) monitoring changes in topography and sediment characteristics; and 4) monitoring changes in the areal distribution of dominant vegetation at each PNA site using a combination of low-level aerial photographic interpretation and established ground-truth methods. Monitoring should proceed over the duration of the project and for several years thereafter. This will allow examination of possible differences in nekton use patterns in PNA prior to, during and after the harbor project. Such an effort would provide useful long-term data and permit the detection of significant impacts on the marsh plant and nekton community due to the harbor project.

As part of a NMFS-supported EFH study conducted in 1998-99, estuarine ecologists at the Beaufort Laboratory investigated nekton using *Spartina* and *Phragmites* marshes located in PNA within the Cape Fear River complex (i.e., Cape Fear, Brunswick and Northeast Cape Fear Rivers). That study showed that these habitats supported a diverse nekton community with high abundance and biomass of important fishery species. Federally managed species (i.e., South Atlantic Fishery Management Council Fishery Management Plans) collected included pink shrimp, white shrimp, gray snapper, crevalle jack, sheepshead, red drum, and bluefish. In addition, other important fishery species collected included blue crab, Atlantic menhaden, white perch, spot, croaker, speckled seatrout, white mullet, striped mullet and southern flounder. Therefore, these highly productive marshes have potentially important ramifications in terms of higher order estuarine food web and fisheries support. Previous work established baseline conditions for EFH and nekton use in project area PNA. Continuation of this work over the project period and for at least two years beyond project completion would provide extremely useful information on PNA nekton response to large system-wide hydrologic changes with potential application to similar navigation projects.



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

REGION 4  
ATLANTA FEDERAL CENTER  
61 FORSYTH STREET  
ATLANTA, GEORGIA 30303-8960

**MAR 22 2008**

Colonel James W. DeLony  
District Engineer  
U.S. Army Corps of Engineers  
Post Office Box 1890  
Wilmington, North Carolina 28402-1890  
ATTN: Frank Yelverton

Subject: Environmental Assessment (EA) for Preconstruction Modifications of  
Authorized Improvements to the Wilmington Harbor Project (WHP),  
Wilmington, NC

Dear Colonel DeLony:

Pursuant to Section 309 of the Clean Air Act, EPA, Region 4 has reviewed the subject document, viz., an examination of the consequences of six major modifications to the original WHP upgrade (which had recently been evaluated via an environmental impact statement [EIS]). When the administrative processing of the EA is completed, the District anticipates issuing a "Finding of No Significant Impact" (FONSI) for these design changes. The proposed modifications to the WHP are extensive in scope and have the potential to engender a number of conditions which could become problematic from an environmental perspective. However, this action also provides some important opportunities to enhance certain environmental amenities (turtle nesting capability) which have recently declined in value/areal extent. The operative issue for all the involved parties will be minimize the former problems and maximize the latter possibilities.

We suggest that before a FONSI is issued for this action, a conference call be set up among the principal agencies to discuss the proposed modifications:

Our chief procedural concern about these modifications is their environmental scope and the precedent of examining them via an EA in lieu of a supplement to the final EIS. Generally, changes of this magnitude are assessed in the context of an EIS format. Notwithstanding the fact that the District has primacy in regard to the election of how comprehensive the evaluation context will be, this decision is at variance with the preponderance of other similar (size and geographic extent) projects in which the District is the lead agency. We understand there are exigencies

associated with meeting the initial timetable set for project milestones. Nonetheless, this determination has ramifications beyond just this project and needs to be discussed further to reach consensus..

On a substantive basis there is a lack of specificity about certain critical design items. For example, the disposition of all (or even most) of the excavated material resulting from the initial construction remains in discussion. Since beach quality material is a valuable commodity, many nearby coastal communities experiencing natural erosion processes are interested in acquiring the sand. A number of sites are mentioned as possibilities for receiving nourishment material. However, actual commitments by the noted communities/beach consortia continue to be examined and await other procedural actions. Similarly, it is reasonable to assume that an ocean capable hydraulic dredge will be used to initially excavate most offshore material; however, other material may need to be handled by other dredge systems and/or transhipped by barge, pump systems, or other means. The type equipment used in this instance will only become known after the FONSI. Because amounts of material and the manner by which it is obtained/manipulated can have an important effect on an action's long-term environmental ramifications, this matter needs to be clarified.

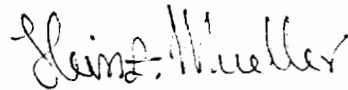
When exact locations are eventually determined emplacing excavated material at many of the suggested beaches (together with the reduced amount of blasting now considered necessary) will not be accomplished without adverse effects. Resource agencies are especially concerned about impacts on endangered species. The sequence of avoidance, minimization, mitigation, and compensation must be employed in this regard. A practicable solution to maximize the mandates of all parties in this regard may not be easy, but must be achieved..

Sediment characteristics of material used in beach nourishment need to be more definitively ascertained, especially in regard to their compatibility with native material. There are numerous cases in which all parties assumed that since the sediments were proximate to a receiving beach and/or in a high energy system that acceptability was a given. Unfortunately, excessive subsequent turbidity and/or accelerated erosion demonstrated that this was not the case. Some important effects of construction activities and their impacts on sensitive marine communities are directly related to the percentage of fine grain material encountered/involved. We are particularly concerned about the effects of long-term turbidity on nearshore biota as fines winnow from deposited material. Fundamental changes in the structural characteristics of the impacted nearshore communities are a distinct possibility absent a reasonable understanding of the textural classes involved. Since this project has such a large geographic context, the cumulative aspects of the proposal are significant and warrant further analysis/consultation.

Construction activities in marine system invariably produce effects which were not initially anticipated. Given the size of this operation, experience suggests that there will be induced erosion/accretion, changes in the overall sand budgets of the nearby beaches and associated littoral zones, etc.. Unfortunately, these consequences often manifest themselves after construction is long finished thereby requiring ever larger and more elegant "fixes" to mitigate the impacts of the original work. The EA would be improved together with ultimate decision-making in this instance if examples of these unforeseen consequences (occasioned by similar type projects) were discussed and what measures the District brought to bear in solving/mitigating these unintended effects.

Thank you for the opportunity to comment. Dr. Gerald Miller of my staff will serve as initial point of contact; he can be contacted at (404) 562-9626.

Sincerely,

A handwritten signature in cursive script that reads "Heinz J. Mueller".

Heinz J. Mueller, Chief  
Office of Environmental Assessment



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Raleigh Field Office  
Post Office Box 33726  
Raleigh, North Carolina 27636-3726

March 30, 2000

Colonel James W. DeLony  
District Engineer  
U.S. Army Corps of Engineers  
Post Office Box 1890  
Wilmington, North Carolina 28402-1890

ATTN: Frank Yelverton

Dear Colonel DeLony:

The U.S. Army Corps of Engineers (Corps) issued a Final Environmental Impact Statement (FEIS) for the Wilmington Harbor 96 Act project in May 1996. Since that time the Corps has made six preconstruction modifications to the Wilmington Harbor 96 Act project. The U.S. Fish and Wildlife Service (Service) issued a Draft Supplemental Fish and Wildlife Coordination Act (FWCA) Report for these project modifications in December 1999. The Service has reviewed the subsequent Environmental Assessment (EA) for Preconstruction Modifications of Authorized Improvements, Wilmington Harbor, North Carolina, CESA W-TS-PE-00-65-0003 issued on February 24, 2000. The following comments do not constitute the report of the Secretary of the Interior as required by Section 2(b) of the FWCA.

This additional review under the National Environmental Policy Act of 1969 (NEPA) has been necessitated by six preconstruction modifications to the original project. These modifications to the Wilmington Harbor 96 Act project are: (1) construction and maintenance of the harbor entrance channel (Baldhead Shoal Channel) along a new alignment through the ocean bar to the northeast; (2) backfilling the abandoned portion of the old ocean bar channel with material unsuitable for beach or littoral zone placement; (3) placement of up to 6 million cubic yards (mcy) of sand dredged from the ocean bar channel, riverine channels upstream through Reaves Point channel, and/or the larger sandy disposal islands of the lower Cape Fear River on area beaches or in the littoral zone; (4) placement in the Offshore Dredge Material Disposal Site (ODMDS) of all dredged sediment that does not go to the beaches, the littoral zone, or abandoned channel; (5) establishment of a clear, comprehensive plan for utilization of all types of dredging equipment and disposal alternatives that are appropriate for use in each specific portion of the project; and, (6) reduction in the area requiring rock blasting, number of blasts, and size of each blast, plus elimination of the bubble curtain to protect aquatic resources during blasting. Two beaches – Bald Head Island and Caswell Beach – are currently proposed to



receive maintenance dredging spoil disposal over the life of the project.

### **General Comments**

Under the NEPA an EA is a decision making document. An EA is produced when the federal action agency is unsure about the significance of the environmental impacts of the project under consideration. The EA is evaluated and project impacts are found to be either insignificant or significant. If impacts are found to be insignificant, the federal agency may release a Finding of No Significant Impacts (FONSI) and the NEPA process is essentially concluded. If the overall impacts are found to have significant impacts, the planning process must move on to the preparation of a Draft Environmental Impact Statement (EIS).

The Service is concerned with the preliminary conclusion of the Corps regarding the significance of the aggregate impacts of the proposed modifications. The EA ends (p. 59) with the statement that the proposed action is not expected to significantly affect the quality of the human environment. The Service strongly believes that such an expectation is premature. We believe a more comprehensive evaluation of impacts with forthcoming data will demonstrate significant impacts. Furthermore, the Service believes that certain adverse environmental impacts that can now be reasonably assumed to occur are significant.

In general, the Service finds the level of impact analyses to be incomplete and inadequate for four reasons. First, important technical information has not yet been fully analyzed and thus the complete nature of certain project impacts cannot be established. Second, even with rather complete data some project impacts have been addressed in only a cursory fashion. Third, the EA fails to fully consider the cumulative impacts of the beach disposal component of this project in the context of other ongoing beach nourishment projects and beach nourishment projects that are now being planned. Fourth, there is the overriding issue of whether the proposed project impacts in the aggregate would have a significant or insignificant impact on the resources of the project area. We will elaborate on these issues with our specific comments.

The Service believes that a complete description of project impacts and a thorough analysis of their significance constitute an essential component of NEPA. Compliance with the disclosure requirements of the NEPA allows the Service to monitor federal trust resources under our jurisdiction and work with the Corps and other federal agencies to develop adequate mitigation measures. If adverse impacts are systematically underestimated, resources such as migratory shorebirds and certain fish species that depend directly and/or indirectly on the beaches and waters of the project area will be adversely affected.

### **Specific Comments**

As noted, the Corps will issue at least one more NEPA document for these proposed modifications. The next document may be either a FONSI or a Draft EIS. The Service is primarily concerned with the adequacy of the planning process mandated by the NEPA.

Therefore, we request that the concerns provided below be addressed in the next NEPA document.

### **Inadequate Analysis Due to Lack of Data or Incomplete Plans**

Sediment compatibility is crucial to evaluating environmental impacts of beach disposal. Without these data the EA is incomplete and the Service cannot evaluate the impacts of the beach disposal to fish and wildlife resources. However, the Corps has not yet completed the technical analysis of sediment that would be dredged. The Service requested the geotechnical information relating to this project, and has received most of what is available at this time. However, core samples between stations 0+00 and 120+00 of Baldhead Shoal Channel were not taken until January 2000. These samples have not been fully processed and available for review at this time. Sediments from this section are proposed for beach disposal. While other data suggest that this material will be beach compatible, no data are presented in the EA to support such compatibility. However, the EA states (p. 27) "compatibility analysis...of the new dredge material...indicates a good match" for beach disposal. The Corps assumes that all of the sediment from this reach will be beach suitable, while adjacent data suggests that might not be the case (i.e., dredging will hit mud before reaching the new channel depth). Furthermore, no samples were taken seaward of station 190+00 to prove that all of the seaward sediments were not beach suitable materials. This includes the section of the new channel that runs through the Offshore Dredged Material Disposal Site (ODMDS), where beach suitable material has been dumped in the past.

The amount of sand that would ultimately be placed on project area beaches has not been determined. The EA notes (p. 6) that the maximum quantity is "... not expected to exceed 6.0 million cubic yards." However, the Sand Management Plan (SMP) notes (Appendix A, p. 4) that the maximum volume "... may be reduced by 20 to 30 percent depending on final quantitative and qualitative analysis and actual dredging operations associated with the dredging contractors decisions to obtain the allowable overdepth." Therefore, the actual amount of sediment that could end up on the beaches may range from about 4 million to 6 million cubic yards providing that no sediments seaward of station 190+00 are beach suitable.

In addition to the uncertainties regarding the quantity of beach disposal material, the actual length of beach to receive the material is uncertain. The EA (p. 16) states that "... it is possible that all sand may not go to the beach destinations due to funding constraints, seasonal restrictions to protect endangered and threatened species, or other unforeseen reasons." The SMP presents two disposal plans. The base plan would move sand to only Bald Head Island and Oak Island-Caswell Beach, a beach length of approximately 7.8 miles. The second, larger option is contingent on federal funding under Section 933 of the Water Resources Development Act of 1986 (Public Law 99-662). If this federal assistance is provided, disposal would be expanded to western Oak Island (25,600 feet) and eastern Holden Beach (10, 600 feet) for a total additional disposal area of approximately 6.9 miles. The overall base plan plus the Section 933 area would result in beach disposal along 14.7 miles of beach. Negotiations are ongoing with local communities to secure this federal assistance. Sand distribution is ultimately dependent upon the

results of coordination with the project sponsor (State of North Carolina) and the beach communities, as well as economic and engineering constraints. Constructed and naturally adjusted berm widths will likewise depend upon the plan selected (EA, p. 5).

The EA notes (p. 17) that the "[s]and that may go to New Hanover County beaches has not yet been designated." These beaches are under consideration to receive 0.6 million cubic yards of material from new work within the channel. One area under consideration is the 7,000 feet south of the rock revetment at Fort Fisher. This beach would be a new site of dredge disposal that the EA does not fully discuss. The Fort Fisher area is known for its unique, nearshore coquina rock outcrops, which would be impacted by any spoil disposal at that location.

The exact magnitude of project impacts ultimately will depend on the determination of sediment volume and length of the disposal area. The present uncertainties create two extreme scenarios. First, the maximum amount of material could be placed on the minimum length of beach. Second, the minimum amount of material could be placed on the maximum length of beach. In the former case, the shorter project length will place a much greater volume of sediments in a confined area and thus intensify the magnitude of impacts. In the latter extreme, a longer project lengths would spread the impacts over a wider area but probably decrease the magnitude of impacts for a stretch of beach. Overall, the Service believes that environmental impacts associated with beach disposal cannot be evaluated without a detailed description of the volume of dredge spoil and the exact location and spatial length over which this material will be placed.

### **Inadequate Analysis of Environmental Impacts**

**Evaluation of Alternatives** - Section 3.01 on the alternatives for the new alignment is vague and does not provide details on the other two alternatives (do nothing and eliminate bends from the channel). The section provides a summary of the preferred alternative rather than a detailed discussion of each alternative. Section 3.02 on the alternatives for beach disposal is also vague and considers only variations of one alternative when four were listed.

**Testing for Contaminated Sediment** - Section 5.01 of the EA states (p. 28) that a 1992 analysis of the harbor sediments judged the material clean by an older set of contamination standards. The Service notes that data from Disposal Islands #3 and #4 that may be pumped out to provide material for beach placement show a significant mud content in many cores. Depending on the origin of this material, these sediments could contain contaminants and should be assessed. An assessment should also be provided as to whether 1992 sampling remains an accurate reflection of current sediment characteristics, which may include significant changes after the series of hurricanes that have struck the Wilmington area in recent years. The Service FWCA Report requested that newer standards be used (the Inland Testing Manual (ITM) adopted by EPA and the Corps in 1998) and that a wider range of sediments be assessed. The Corps responded (p. 48) that prior testing was adequate and no separate evaluation under the ITM is required.

**Bathymetric Changes** - The Service FWCA Report recommended that the Corps make

bathymetric surveys outside of the ODMDS buffer zone along the Baldhead Shoal Channel. The Corps responded (p. 49) that "Bathymetric changes that may occur outside authorized Federal navigation channels are not a concern of our maintenance dredging program and, therefore, are not monitored." This position precludes the detection of any alterations to the active littoral system that may be the result of the navigational channel and its maintenance, and thus prevents any data and subsequent mitigation for adverse impacts to adjacent nearshore and beach habitats in both the short and long-term.

**Elimination of Restriction on Dredging Operations** - The Corps has not fully addressed the impacts to aquatic resources from the expansion of dredging methods and the use of overflowed dredges in estuarine waters. The EA discusses (pp. 37-38) monitoring in areas near Primary Nursery Areas (PNAs) but does not describe the impacts to fish and wildlife resources within and outside PNAs in sufficient detail.

**Non-beneficial Use of Rock** - The EA states (p. 36) that rock could benefit the Wilmington Offshore Fisheries Enhancement Structure (WOFES) which has not reached its design dimensions. However, rock removed during construction that contained a substantial amount of fine sediment (silt/clay) would be considered unsuitable for disposal at the WOFES. Furthermore, the Corps states (p. 8) that "... other unforeseen reasons ..." may preclude the disposal of rock in the WOFES. Rock that does not go to the WOFES would be placed in the ODMDS or at the Eagle Island confined disposal facility (CDF). If the spoil could be sifted to separate the rock from the finer sediments, disposal of the rock on the WOFES would be more beneficial to fish and aquatic resources than at the ODMDS or Eagle Island. The EA should discuss this option.

**Blasting in the River** - The rock blasting in the river will undoubtedly kill some aquatic resources. The use of nets instead of bubble curtains may pose additional threats to aquatic resources that may become entangled in the nets. The EA fails to adequately address the significance of the aquatic resources that could be harmed by this modification.

**Altered Beach Characteristics** - Beach disposal may alter the sedimentology, stratigraphy, and profile of beaches. Changes in the grain size characteristics of the disposal beach, even if overall grain data are judged suitable, may result in alteration of sand compaction, shear resistance, moisture content, grain shape and grain size distribution. These changes may have biological significance for organisms that use beaches for feeding, resting, or reproduction. Beach invertebrate populations may be lower and community structure may show lower diversity. Lower productivity among beach invertebrates would result in reduced utilization of the nearshore waters by fish of commercial and sport interests. The value of the area as a feeding site for migrating shorebirds and macro-invertebrates would also be reduced.

**Mud and Turbidity** - Geotechnical data indicate that there is a high mud content throughout most of the offshore project area and Disposal Islands #3 and #4 proposed for pump out to New Hanover County beaches. This information is not included in the EA, however, and the potential

for high levels of nearshore turbidity and siltation resulting from beach placement of muddy material is not addressed. The environmental impacts from pumping out these disposal islands with high localized mud contents need to be considered in the EA.

**Summer Beach Disposal** - The next NEPA document should fully consider the adverse impacts of beach disposal operations during the warmer months of the year. The current EA notes (p. 12) that proposed modifications would remove ". . . the seasonal restriction on beach placement of sand (currently allowed from November 15 through April 30)." The new construction schedule calls for beach disposal over 18 consecutive months (December 2000-June 2002). Heavy equipment on the beach, daily turbidity, new inputs of sand, continually reworked sediment and a host of other changing sedimentological characteristics are likely to create diminished habitat value for beach invertebrates, shorebirds, surf fishes and other trust resources. Furthermore, dredging projects with oceanic borrow and fill areas are notorious for lengthy weather delays during the winter, which could extend the construction period further into a second warm weather season.

Continuous dredge spoil disposal will impact beach invertebrate populations. In the project area, the warmer months constitute the period of greatest biological activity. Beach invertebrates such as the mole crab (*Emerita talpoida*) and coquina clam (*Donax variabilis*) colonize the beach in the spring and remain on the beach in high numbers throughout the summer and fall. Placement during recruitment seasons may significantly depress invertebrate abundances, which are the basis of the food web for many macro-invertebrates, surf fishes and shorebirds. The EA comments that extensive beach bulldozing has likely already depressed invertebrate population levels, but does not address that activity in the cumulative impacts of the project modifications as would be appropriate. The fact that certain resources have been depressed by other activities is not a valid excuse to proceed with other harmful measures that could be avoided.

Almost two complete shorebird nesting seasons would be disrupted by the proposed beach disposal schedule. Area beaches attract numerous pelicans, gulls, and terns. Species that may nest on less-disturbed beaches include the Wilson's plover (*Charadrius wilsonia*), American oystercatcher (*Haematopus palliatus*), least tern (*Sterna albifrons*), and black skimmers (*Rynchops niger*). Both the royal tern (*S. maxima*) and sandwich tern (*S. sandvicensis*) may be on area beaches during the summer. During the warmer periods of spring and fall shorebird migration, project area beaches represent feeding and resting areas for sandpipers and plovers.

The EA states (p. 42) that the additional cost of mobilizing-demobilizing dredges is \$5.25 million in order to avoid beach disposal during the warm weather season. Other project modifications will save the Corps an estimated \$60 million, or 11.4 times the savings from a continuous beach disposal work schedule. The additional costs of repeated mobilization and demobilization of dredges over three winter seasons instead of a consecutive 18 month period could be alleviated if the dredging equipment could shift activities from beach disposal to other disposal sites during the intervening summers. Beach suitable spoil may be stockpiled or the dredges could shift to dredging non-beach quality sediment during warmer months. The entire

project schedule extends for 5 years, so effectively doubling the time to place dredge spoil on the beaches to 3 years will not compromise the rest of the project schedule. The purpose of the project modifications is not storm protection for beachfront communities. Delaying completion of the dredge spoil disposal from 18 to 36 months is not excused by the argument that it will delay protection of threatened oceanfront structures or infrastructure.

The EA does not adequately address the impacts of beach disposal operations during the warmer months of the year. The EA discussion on Esthetic and Recreational Resources (p. 41) is the only section of the EA that describes the bulldozers, pipes, and other heavy equipment that will be necessary along the beaches while beach disposal is taking place. No discussion is given to the impacts of this equipment on beach compaction; invertebrate burrows; shorebird foraging, loafing and nesting; aeolian sediment transport rates and volumes; or the beach groundwater system. The EA does not indicate whether beach disposal would occur 24 hours a day with lights at night, or if the equipment will be removed from the beaches at night. However, normal operation of large hydraulic dredges that would work in the harbor is 24 hours per day and seven days a week (p. 31). Night work would also disturb homeowners trying to sleep at night, confuse birds in flight, and interfere with the activities of other nocturnal species.

The Service's FWCA Report recommendation concerning heavy equipment on the beach and night work activities is also not fully addressed. The Corps' response (p. 51) provides no details and no conservation measures for fish and wildlife resources that would interfere with "work requirements." Likewise the recommendation regarding monitoring of escarpments and compaction of beach deposited dredge spoil is inadequate in that it does not provide any details regarding the timing, spatial extent, or reporting procedures for the monitoring. Standard monitoring procedures that the Corps utilizes for federal projects such as these should be outlined and discussed in individual NEPA documents for each project to which they are applied. This would allow full disclosure and public comment on the appropriateness of those procedures for each project. The Corps' response (pp. 51-52) to recommended long-term monitoring at Bald Head Island and Caswell Beach is insufficient and provides no means for measuring long-term impacts to fish and wildlife resources. The monitoring of federally-listed species mentioned is work conducted independent of this project rather than an addition to it. A similar response (pp. 53-54) was provided for the Service's recommendation for monitoring impacts on aquatic resources.

**Initiation of Long-term Beach Disposal** - The current EA does not adequately consider the long-term environmental impacts of initiating a permanent beach disposal operation on Bald Head Island and East Oak Island-Caswell Beach. The only discussion of these environmental impacts occurs in the SMP (Appendix A, p. 11). Current plans indicate that approximately one million cubic yards of material would be available for beach disposal every two years. In years 2, 4, and 8 this material would go on Bald Head Island; in year 6 sediment would go to Caswell Beach. The SMP notes that beach invertebrates may be smothered or displaced, but that recovery may occur after one year and notes that "... nearshore organisms would not be completely eliminated from the area as a result of the disposal operation." Furthermore, the EA



contains no commitment to perform maintenance work during the colder period of lowest biological activity. The EA only notes (p. 34) that sand placements will be conducted during the winter months "... to the maximum extent practical. . ." The current EA contains no consideration of the gradual reduction in population levels that might occur over decades as the result of periodic, severe population decimations during years of beach disposal.

**Hardbottoms** - The EA states (p. 2) that the seaward extension of the existing channel would pass through a "substantial amount of live coral and other valuable hardbottoms", but later states (p. 36) that reef-forming coral "... are not known from the immediate project vicinity." Dredging to construct the new alignment is expected to have "no direct impacts on hardbottoms" (p. 33-34). However, the discussion of impacts to offshore hardbottoms (p. 27) does not address turbidity and siltation from dredging of the new channel, backfilling the old channel, and transporting overfilled dredges to area beaches. If live corals are adjacent to the old channel that would be abandoned, they may be destroyed by sediment disposal used to fill this channel. The Corps should provide more discussion of information used to assess the presence of and impact to corals as a result of the proposed project modifications.

The EA does not adequately address project impacts on ecologically important hardbottom areas that may be near disposal beaches. Kure Beach's coquina outcrops are not listed in the hardbottoms discussion, and neither are the hardbottoms immediately offshore of Oak Island. The EA claims (p. 28) that all known hardbottoms off Brunswick County are seaward of the active littoral zone. However, the Service FWCA Report (pp. 11-12) discusses reports indicating that hardbottoms may be immediately offshore of the proposed disposal beaches of Oak Island. The discussion of impacts to hardbottoms (p. 27) does not address turbidity transporting overfilled dredges to the beach and the washing of fine-grained material off the beach onto hardbottoms immediately off of Oak Island.

**Littoral Sand Movement** - Another long-term impact not adequately addressed by the EA is changes to the local oceanfront erosion rates which could increase as sediment traveling alongshore sinks into the newer, deeper channel. While these impacts to the longshore sediment transport system are clearly significant, they were not discussed in the present EA (other than the SMP appendix) nor in the Final EIS of June 1996. The Sand Management Plan (SMP) provided in Appendix A of the EA describes how this will occur in the following sections:

(SMP, Section 18, p. 9) "The construction and maintenance of a deep ocean entrance channel through a tidal inlet will have the same impact on the movement of littoral sediment past the entrance as stabilizing structures such as jetties. However, the impacts of a dredge channel on the adjacent shorelines are generally more subtle than the impacts associated with stabilizing structures. In the case of stabilizing structures, there is usually a visible build-up of material adjacent to the updrift structure with corresponding erosion downdrift of the opposite structure. These impacts are normally clearly visible and measurable within distances of thousands of feet of the structures. Navigation projects that include stabilizing



structures are generally formulated to include some means to bypass sand from one side of the entrance to the other in order to prevent project induced erosion on the adjacent beaches. Dredged channels, on the other hand, do not cause material to build-up on one side of the inlet or the other, rather, the impact of sediment removal from the dredged channel tends to be diffused throughout the impacted area. Since this diffusion process can extend over miles of shoreline, the erosive impact of the sediment removed from the navigation channel and its deposition outside the active littoral zone is difficult to detect in the short term since the magnitude of the impact may be of the same order as normal temporal fluctuations in the shoreline position. Also, where stabilizing structures generally have a well defined impact on the predominant downdrift beach, channel projects affect both sides as material is deposited in the navigation channel from both the updrift and downdrift beaches."

(SMP, Section 20, pp. 9-10) "Years of research by the U.S. Army Corps of Engineers and practical knowledge gained from the operation of the numerous coastal navigation projects around the country has resulted in the realization that littoral material must be conserved. Natural supplies from rivers and streams are not replenishing littoral sediments, particularly on the East Coast of the United States. Thus, the removal of a cubic yard of littoral sediment from a tidal entrance or inlet with deposition outside the active littoral zone of the beach will ultimately cause a cubic yard deficit somewhere within the sand sharing system affected by that particular entrance or inlet. The impact of the removal of littoral sediment from the active littoral zone through channel maintenance is identified as a major cause of man-induced erosion in the U.S. Army Corps of Engineers Shore Protection Manual. From an engineering perspective, the primary requirement for the Wilmington Harbor maintenance program, apart from assuring that the channel remains open year-round, is to prevent project induced erosion of the adjacent beaches by conserving the limited natural resource, sand, through deposition directly on the adjacent beaches."

The EA fails to address the environmental impacts of increased erosion rates of adjacent beaches other than to state (p. 27) that the beach disposal "will result in enhancement of the regional sediment budget" and that "erosion rates on the adjacent beaches will be reduced compared to historic rates." These statements are not completely accurate. Moving sediment from one part of the littoral system to another (i.e., dredging from an inlet channel and disposal on adjacent beaches) does not produce a net increase in the regional sediment budget. Sediment placed in the ODMDS or disposal islands will actually decrease the regional sediment budget. Beach placement of dredge spoil will simply redistribute where the sediment is found in the system, not increase its volume. The second statement regarding erosion rates is valid in that the long-term erosion trend will have a glitch with the input of dredge spoil, but the position of the beach will be all that has changed. The actual contemporaneous rate at which the sediment erodes will be

equal to or greater than current rates, as the Corps states repeatedly in the SMP.

The disruption of the natural littoral drift across the mouth of the Cape Fear River is a significant indirect environmental impact. A wave transformation analysis was conducted to determine whether the new channel alignment would change sediment transport at the mouth of the river. While the Corps reports (p. 27) that the project would not alter the "sand transport potential," this analysis has not been discussed in detail or in relation to the SMP statements given above regarding modifications to the longshore sediment transport system. Any alteration in erosion rates would create significant impacts over the project's life. Environmental impacts would also be significant in a cumulative sense when the present project is considered in the context of other North Carolina dredge and fill projects. Therefore, the Service requests that the next NEPA document provide a thorough assessment of indirect, long-term and cumulative environmental impacts associated with project-induced changes to the longshore sediment transport system and subsequent habitat loss.

Removing sediment from the nearshore littoral system (i.e., placement in disposal islands or the ODMDS) will increase the physical impacts to local beaches and fish and wildlife resources that inhabit them. Current project plans (Appendix A, p. 3) call for initial construction to remove at least 2.8 million cubic yards of non-beach quality material and place it in the ODMDS. Furthermore, material may be removed from the littoral system if small, "problem shoals" develop in the channel between maintenance events; this material would be moved by hopper dredge to the ODMDS (Appendix A, p. 12). While river borne sediment may eventually replace this material, full replacement may require many years during which impacts associated with this removal would persist. The impacts of removing sediment from the littoral system during both initial construction and subsequent maintenance have not been fully evaluated and the Service requests that the next NEPA document address the issue in a comprehensive manner.

### **Cumulative Impacts Analysis**

The consideration of cumulative impacts is totally inadequate. Section 5.14 of the EA simply chronicles (pp. 43-44) past harbor modifications, lists certain perceived benefits of the project, and concludes that "cumulative impacts of the proposed action appear negligible." This section makes no attempt to consider the adverse impacts of beach disposal on natural resources in the context of ongoing projects of a similar nature and similar projects that are planned for the future.

The lack of an complete cumulative impact analysis may be the result of a common misunderstanding of cumulative impacts as they are defined in the NEPA. As given in § 1508.7 Title 40 Code of Federal Regulations, a cumulative impact is the impact on the environment which results from the incremental impact of the action when added to **other** past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. A key phrase in this definition is "other projects." Cumulative impacts are not those associated with repetitive actions that may be a part of the

project under consideration, but are associated with other projects in a defined area. The long-term impacts of repetitive actions would be secondary project impacts. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Cumulative impacts must be defined in the context of a given environmental component or resource, a specific geographic area, and a time frame.

The Service requests that the next NEPA document for this project contain a cumulative impacts analysis that places current beach disposal operations in the context of ongoing beach nourishment projects and projects which are now in various stages of planning. Resources to be included in a cumulative impact analysis should include populations of beach invertebrates, feeding and resting habitat for non-breeding (migratory and over-wintering) shorebirds, populations of marine benthic invertebrates, and habitat for nearshore fishes. The time frame for the analysis may be the standard 50 year period of federal beach nourishment projects.

The geographic area of this analysis should be, at a minimum, the area from Wrightsville Beach in the north along the coast to Sunset Beach near the South Carolina line. This area would require a consideration of the Brunswick County Beaches Nourishment project (for 2004-2005) which may occur only 2-3 years after beach disposal from this project is complete. The nearby federal nourishment projects at Wrightsville, Carolina and Kure Beaches and the proposed nourishment projects at Oak Island, Holden Beach, and Ocean Isle all create an environment of very few undisturbed beaches in Brunswick and New Hanover Counties (Figure Eight Island conducts private beach nourishment activities). Potential use of Jay Bird Shoals as a borrow area for the Oak Island and Holden Beach projects also needs to be included as requiring review in cumulative impact assessments. The use of this offshore borrow area should be analyzed in the context of other offshore borrow areas used for New Hanover County Beaches and those under consideration for Ocean Isle Beach and Brunswick County Beaches.

### **Determination of Significance of Environmental Impacts**

The EA ends (p. 59) with the statement that the proposed action is not expected to significantly affect the quality of the human environment. The Service strongly believes that such an expectation is totally premature. First, several project features that will ultimately influence the level of environmental impact have yet to be finalized. While it is possible to speak of maximum sand quantities and a maximum beach length, the interplay of these two important factors has a critical role in project impacts. These factors should be firmly established before any determination of the significance of project impacts.

There are other project features for which a rough approximation of the nature and degree of environmental impacts should be made in further NEPA documentation. These project features, in no order of importance, are:

- Dredging a new navigation channel that will profoundly alter 438 acres of marine bottoms (while adverse impacts associated with the new alignment may be less than

enlarging the old alignment, this does not mean that construction of the proposed channel will have an insignificant impact on the environment);

- Permanently altering the movement of sand within the longshore transport system (an impact not considered in the 1996 Final EIS) and henceforth requiring the Corps to move the naturally appropriate amount of sand, at the appropriate time, to the natural location in order to avoid excessive, project-induced beach recession;
- Removing at least 2.8 million cubic yards of material from the littoral system during initial project construction and the subsequent removal of lesser quantities during maintenance when it is acknowledged that each cubic yard removed from the littoral system will produce a deficit on one cubic yard elsewhere in the sand sharing system;
- Disposing of up to six million cubic yards of dredged material along beaches that may range from 7.8 to 14.7 miles;
- Disposing of dredging material during a single, continuous 18-month operation that will cause disruptions during one and perhaps a second period of maximum biological activity for shorebirds and beach invertebrates that form an important base to the coastal food chain;
- Conducting approximately 725 blasts on the bottom of the Cape Fear River which is important habitat and migratory pathway for many species of fish;
- Initiating a permanent program of beach disposal on two beaches (Bald Head Island and Caswell Beach) and perhaps a third (area south of Fort Fisher);
- Eliminating certain restrictions on dredging operations and sediment transport that are considered beneficial to water quality and aquatic organisms; and,
- Adding to the loss of natural, unaltered beaches in southeastern North Carolina through the cumulative impacts of the present project when viewed in the perspective of ongoing beach nourishment projects (Wrightsville, Carolina and Kure Beaches) and projects that are being planned (Ocean Isle Beach and Brunswick County Beaches).

At the present time it is the opinion of the Service that the aggregate environmental impacts of the project features listed above will be significant in the sense of the NEPA. We see no justification for a FONSI. The level of environmental impacts for those project features which are now reasonably well established and the greater level of analysis which we have requested in this letter clearly indicate that compliance with the NEPA requires the preparation of an EIS.

An important point to consider is that well established mitigation measures are available to reduce the environmental impacts of the proposed measures. In many cases these mitigation measures can make the difference in whether a given project feature would have a significant or insignificant environmental impact. The Corps should not expect these mitigation measures to be cost neutral. The preservation of environmental quality usually comes at a price.

It would be possible for the Corps to make major reductions in the level of environmental impacts which are now likely to occur. Many of these measures were contained in the recommendations of our December 1999 Draft Supplemental FWCA Report. For instance, beach disposal could be scheduled for 3 winter periods and completely avoid the warmer periods

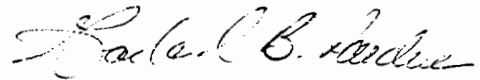
of highest biological activity. While fish cannot be totally protected from the proposed blasts, the impacts could be mitigated as we suggest in recommendation 19. However, the Corps responded that "mitigation is not needed for the elimination of the bubble curtain." In recommendation 5, the Service noted that the abandoned channel could be used to mitigate the marine habitats lost along the new alignment. The Corps responded that such an effort would probably be impossible.

The Service believes that the next NEPA document issued by the Corps must have all the characteristics, regardless of its official title, of an EIS. The Service suggests that the Corps consider issuing a revised EA that addresses the concerns we have discussed. This document would provide an opportunity to provide extensive mitigation measures to reduce the current level of environmental impacts. The revised EA must provide the same level of description and depth of analysis that would normally be presented in an EIS. The revised EA must not be combined with a FONSI, but should be released as a stand-alone document for general review. The critical point is not the title of the document but the adequacy of data presentation and analyses.

If the Corps chooses to retain all the project features presented in the EA, the Service has no choice but to recommend that an EIS be prepared. The scope and magnitude of environmental impacts that are almost certain to occur are simply inconsistent with a FONSI. It would be most unfortunate if the direct, indirect, and cumulative effects associated with the proposed modifications became an accepted standard for insignificant impacts on the environment. In order to maintain the environmental protection that the NEPA provides, the Service can not support the current Corps' initial finding that the proposed actions would not significantly alter the quality of the human environment.

The Service appreciates the opportunity to comment on the proposed modifications to the Wilmington Harbor 96 Act. If you should have any questions or comments, please contact Tracy Rice or Howard Hall of my staff at (919) 856-4520, extensions 12 and 27 respectively, or electronically at [Tracy\\_Rice@fws.gov](mailto:Tracy_Rice@fws.gov) or [Howard\\_Hall@fws.gov](mailto:Howard_Hall@fws.gov).

Sincerely,



Garland B. Pardue  
Ecological Services Supervisor

cc:

Brian Cole, USFWS, Asheville, NC

Willard Cole, South Atlantic Fisheries Coordination Office, Morehead City, NC

Bruce Bell, FWS Regional Office, Atlanta, GA

Gerald Miller, USEPA, Atlanta, GA

Ron Sechler, NMFS, Beaufort, NC  
John Dorney, N.C. Division of Water Quality, Raleigh, NC  
Ruth Boettcher, N.C. Wildlife Resources Commission, Marshallberg, NC  
David H. Allen, N.C. Wildlife Resources Commission, Trenton, NC  
Melba McGee, Office of Legislative and Intergovernment Affairs, Raleigh, NC  
John Morris, N.C. Division of Water Resources, Raleigh, NC  
Doug Huggett, N.C. Division of Coastal Management, Raleigh, NC  
Steve Benton, N.C. Division of Coastal Management, Raleigh, NC  
Preston Pate, N.C. Division of Marine Fisheries, Morehead City, NC  
Walker Golder, National Audubon Society, Wrightsville Beach, NC  
Trip Van Noppen, Southern Environmental Law Center, Chapel Hill, NC  
Todd Miller, North Carolina Coastal Federation, Newport, NC

FWS/R4:TMRice:TMR:3/30/00:919/856-4520 extension 12:\EA\_comments.wpd



Action: PM  
CF: DE DX  
DP TS  
PAO RG

March 6, 2000

ERIK STROMBERG  
Executive Director

Colonel James W. DeLony  
District Engineer  
Department of the Army  
Wilmington District, Corps of Engineers  
P.O. Box 1890  
Wilmington, NC 28402-1890

Dear Colonel DeLony:

I am writing in support of the Environmental Assessment and Finding of No Significant Impact for the pre construction modifications to the Wilmington Harbor Project.

The project to deepen the Cape Fear River navigation channel from 38 feet to 42 feet is a win-win situation for all North Carolina citizens, not only in terms of enhancing the statewide economic impact of the Ports Authority's activities, but for preserving and protecting our fragile coastline.

The significance of the environmental work is clearly illustrated by its placement at the beginning of the deepening project. Firstly, the new alignment of the ocean bar entrance at the mouth of the Cape Fear provides multiple benefits. It avoids the use of blasting and rock disposal which would have been required to deepen the ocean bar on its current alignment. The creation of a new entrance channel also avoids disturbing live coral bottoms which would be impacted by deepening the existing entrance channel.

Additional environmental positives will be realized at the site of the existing ocean bar entrance when it no longer is used as a shipping channel. It can then be backfilled with non-beach quality material from the deepening and maintenance of the inner harbor reaches. This environment will allow for the recruitment of benthic life forms and will reestablish fishing and shrimping grounds for reclamation by local commercial fishermen and shrimpers.

Moving the ocean bar entrance also lowers the total project cost by millions of dollars and - critically - keeps the project on schedule.

NORTH CAROLINA STATE PORTS AUTHORITY

P.O. Box 9002 ■ Wilmington, NC 28402 ■ Tel: (910) 343-6232 ■ Fax: (910) 343-6237 ■ email: stromberg@ncports.com ■ <http://www.ncports.com>



Colonel James W. DeLony  
March 6, 2000  
Page Two.

Another absolutely key element of the Wilmington Harbor Project is renourishment of Brunswick and New Hanover County shoreline with beach quality sand that taken from the river bottom. Plans call for some 6 million cubic yards of sand to be placed on area beaches in the construction phase of the project with additional sand made available through the beach communities during the regular annual maintenance program for the foreseeable future.

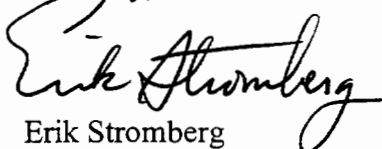
In addition to these significant environmental benefits, North Carolina's Ports also provide substantial statewide economic benefits. The Wilmington Harbor Project's navigation benefits are absolutely essential to the future of the Port of Wilmington to keep current business, let alone attract new customers.

North Carolina's Ports serve as gateways to the global marketplace for our State's importers and exporters. Cargo handling activities at the Ports of Wilmington and Morehead City statewide account for over 80,000 jobs and nearly \$300 million in tax revenues. As one example, the 42-foot channel to the Port of Wilmington will allow a 900-foot container ship to realize up to \$12 million worth of additional cargo per port call, thereby allowing North Carolina's business and industry to expand manufacturing for export markets, creating more jobs and economic benefits throughout the state.

North Carolina will realize benefits from the navigation improvements to the Cape Fear River well into the future with additional jobs, income, sales and tax revenues -- not to mention a sharper competitive edge for the State's business and industry.

I concur that this project will not significantly affect the quality of the human environment, but will, in fact, contribute significant enhancements. Accordingly, I support a Finding of No Significant Impact for the Wilmington Harbor Project.

Sincerely,

A handwritten signature in black ink, appearing to read "Erik Stromberg". The signature is fluid and cursive, with the first name "Erik" and last name "Stromberg" clearly distinguishable.

Erik Stromberg

/ca

NORTH CAROLINA DEPARTMENT OF  
ENVIRONMENT AND NATURAL RESOURCES



JAMES B. HUNT JR.  
GOVERNOR

BILL HOLMAN  
SECRETARY

MEMORANDUM

RECEIVED

MAR 30 2000

TO: Chrys Baggett  
State Clearinghouse N.C. STATE CLEARINGHOUSE

FROM: Melba McGee *MB*  
Project Review Coordinator

RE: 00-0399 EA Wilmington Harbor  
Improvements, New Hanover and Brunswick  
Counties

DATE: March 30, 2000

The Department of Environment and Natural Resources has reviewed the proposed Preconstruction and Modifications of Authorized Improvements to the Wilmington Harbor Environmental Assessment. As a result of the review, our divisions found that the application did not contain enough environmental specification to allow complete evaluation.

Departmental divisions have put emphasis on possible cumulative impacts, wetland impacts, as well as, impacts to SAV and PNAS that may result from channel dredging. Another concern is the disposal of sand on sea turtle nesting beaches and in general the effects of blasting on all habitat within this area.

Considering the fact that the assessment has not yet developed into a decision making document, it is felt that the applicant would benefit more by amending the Environmental Assessment. The department encourages the Corps of Engineers to directly notify our commenting divisions so questions are satisfactorily resolved. Specifically addressing our concerns in a revised Environmental Assessment yields the best

NC SCHOOLS  
**FIRST**  
IN AMERICA  
2010

opportunity for this department to avoid delays during the permit processing stage.

Thank you for the opportunity to respond.

Attachments



JAMES B. HUNT JR.  
GOVERNOR

WAYNE MCDEVITT  
SECRETARY

DONNA D. MOFFITT  
DIRECTOR

NORTH CAROLINA DEPARTMENT OF  
ENVIRONMENT AND NATURAL RESOURCES

DIVISION OF COASTAL MANAGEMENT

MEMORANDUM

TO: Melba McGee, NC Division of Policy and Development  
FROM: Steve Benton, NC Division of Coastal Management  
SUBJECT: Review of SCH# 00-0399

DATE: 2/28/2000

☒ A COPY OF ALL COMMENTS RECEIVED  
BY THE SCH IS REQUESTED

☐ REVIEWER COMMENTS  
ATTACHED

Review Comments:

☒ This document is being reviewed for ~~consistency~~ with the NC Coastal Management Program pursuant to federal law and or NC Executive Order 15. Agency comments received by SCH are needed to develop the State's consistency position.

Project Review Number (if different from above) DCM 00-14

A consistency position will be developed based upon our review on or before \_\_\_\_\_.

☐ A Consistency Determination document \_\_\_\_\_ is, or \_\_\_\_\_ may be required for this project pursuant to federal law and or NC Executive Order 15. Applicant should contact Steve Benton or Caroline Bellis in Raleigh, phone (919)733-2293, for information on proper document format and applicable state guidelines and land use plan policies.

☐ Proposal is in draft form, a consistency response is inappropriate at this time. A Consistency Determination should be included in the final document.

☐ A Consistency Determination Document (pursuant to federal law and/or NC Executive Order 15) is not required.

☐ A consistency response has already been issued.

Project Number \_\_\_\_\_ Date Issued \_\_\_\_\_

☐ Proposal involves < 20 Acres and or a structure < 60,000 Square Feet and no AEC's or Land Use Plan problems.

☐ Proposal is not in the Coastal Area and will have no significant impacts on any land or water use or natural resources of the Coastal Area.

☐ A CAMA Permit \_\_\_\_\_ is, or \_\_\_\_\_ may be required for all or part of this project. Applicant should contact \_\_\_\_\_ in \_\_\_\_\_, phone # \_\_\_\_\_, for information.

☐ A CAMA Permit \_\_\_\_\_ has already been issued, or \_\_\_\_\_ is currently being reviewed under separate circulation. Permit Number \_\_\_\_\_ Date Issued \_\_\_\_\_

☒ Other (see attached). DCM will attend meeting 3/1/2000

State of North Carolina Consistency Position:

☐ The proposal is consistent with the NC Coastal Management Program provided that all conditions are adhered to and that all state authorization and/or permit requirements are met prior to implementation of the project.

☐ The proposal is inconsistent with the NC Coastal Management Program.

☐ Other (see attached).

NORTH CAROLINA STATE CLEARINGHOUSE  
DEPARTMENT OF ADMINISTRATION  
INTERGOVERNMENTAL REVIEW

STATE NUMBER: 00-E-0000-0399

HO

DATE RECEIVED: 02/18/2000

AGENCY RESPONSE: 03/13/2000

REVIEW CLOSED: 03/18/2000

Ms. Renee Gledhill-Earley  
Clearinghouse Coordinator  
Dept. of Cultural Resources  
Archives-History Bldg.  
MSC # 4617  
Raleigh NC

RECEIVED  
FEB 22 2000

REVIEW DISTRIBUTION

Cape Fear Council of Governments  
DEHNR - COASTAL MGT  
Dept. of Cultural Resources  
Dept. of Environment & Natural Res  
Dept. of Transportation

HISTORIC PRESERVATION OFFICE

@ Nkt+agm  
3/3/00

ER-8852  
UH20 3/7

PROJECT INFORMATION

APPLICANT: Dept. of the Army  
TYPE: National Environmental Policy Act  
ERD: Environmental Assessment  
DESC: Reconstruction Modifications of Authorized Improvements at Wilmington Harbor, NC

The attached project has been submitted to the N. C. State Clearinghouse for intergovernmental review. Please review and submit your response by the above indicated date. If additional review time is needed, please contact this office at (919)807-2425.

AS A RESULT OF THIS REVIEW THE FOLLOWING IS SUBMITTED:

☒ NO COMMENT

☐ COMMENTS ATTACHED

SIGNED BY:

Renee Gledhill-Earley

DATE:

3/7/00

RECEIVED

MAR 10 2000

N.C. STATE CLEARINGHOUSE

FEB 24 2000

State of North Carolina  
Department of Environment  
and Natural Resources  
Division of Water Quality

James B. Hunt, Jr., Governor  
Bill Holman, Secretary  
Kerr T. Stevens, Director



**MEMORANDUM**

**TO:** Milt Rhodes  
**THROUGH:** John Dorney, DWQ  
**FROM:** Shannon Stewart, DWQ *Shannon Stewart*  
**DATE:** March 13, 2000  
**SUBJECT:** Wilmington Harbor

Based on a review of the subject EA, the following additional issues need to be clarified and further documented in an amended EA:

1. Wetland impacts have been proposed as part of this project associated with access channel dredging and the placement of dredge pipeline routes. All wetland impacts should be minimized to the greatest extent possible. Prior to the approval of a 401 Water Quality Certification, these impacts will have to be quantified and appropriate mitigation activities planned and approved by NC Division of Water Quality staff. If dredge pipelines must unavoidably cross wetland areas, measures to prevent leakage must be employed and the site(s) must be returned to original conditions after pipeline removal.
2. In addition to wetlands, impacts to SAV, PNAs, and natural shellfish beds from access channel dredging and the placement of dredge pipeline routes should also be minimized to the greatest extent possible. If dredge pipelines must unavoidably cross these areas, measures to prevent leakage must be employed and the site(s) must be returned to original conditions after pipeline removal.
3. Provisions for overflow dredging adjacent to PNAs and contiguous to PNAs as listed in Section 5.02 of the EA and in the Overflow Monitoring Plan should be strictly enforced to ensure the protection of water quality in these sensitive areas.
4. The EA states that the loss of benthic habitat that is proposed by this project will be offset by the backfilling of the existing, abandoned channel. To the extent possible, the abandoned channel should be backfilled with substrate very similar to adjacent benthic substrates. This will allow for the successful recolonization of benthic organisms in this area. This area should also be monitored long-term to evaluate mitigation success.

If there are any questions regarding this matter or these comments, please contact Shannon Stewart at [shannon.stewart@ncmail.net](mailto:shannon.stewart@ncmail.net) or at 919-733-9582.

State of North Carolina  
Department of Environment  
and Natural Resources  
Division of Water Quality

James B. Hunt, Jr., Governor  
Bill Holman, Secretary  
T. Kerr Stevens, Director



March 17, 2000

**MEMORANDUM**

TO: Melba McGee  
Department of Environment and Natural Resources

FROM: Milt Rhodes *M. Rhodes*  
Division of Water Quality

SUBJECT: Environmental Assessment for the Preconstruction and Modification of  
Authorized Improvements to the Wilmington, NC Harbor, Army Corps of  
Engineers. DENR# 00E-0399, DWQ# 12633

The Division of Water Quality (Division) has reviewed the Environmental Assessment document for the Preconstruction and Modification of Authorized Improvements to the Wilmington, NC Harbor and offers the following comments.

This document was reviewed by staff in the wetlands unit and planning branch of the Division for consistency with the State Environmental Protection Act. The full comments are attached to this letter, but in summary, these issues must be addressed in an amended document before the Division can allow the Environmental Assessment document to proceed to the state clearinghouse for public review.

1. Please state the measures to avoid and prevent leakage associated with the project where dredge pipelines will cross wetland areas, and document the plans to return wetland areas to original conditions prior to completion of project activities.
2. Please state the measures to avoid and prevent leakage associated with the project where dredge pipelines will cross submerged aquatic vegetation, public nursery areas (PNA), or natural shellfish beds, and document the plans to return wetland areas to original conditions after project activities are completed.
3. Provisions for overflow dredging adjacent to PNA and contiguous to PNA as listed in Section 5.02 of the EA and in the Overflow Monitoring Plan should be strictly enforced to ensure the protection of water quality in these sensitive areas.
4. Long-term monitoring of the area to be back filled with substrate should be included as part of the project life cycle, and substrate material very similar to the benthic area to be dredged should be used in this back filling component of the project.

Thank you for the opportunity to comment.

TMR: / Wilmington, NC Harbor, DENR00E-0399



State of North Carolina  
Department of Environment and Natural Resources

Reviewing Office: Wilmington

**INTERGOVERNMENTAL REVIEW – PROJECT COMMENTS**

Project Number: 00E-0399 Due Date: 3/13/00

After review of this project it has been determined that the ENR permit(s) and/or approvals indicated may need to be obtained in order for this project to comply with North Carolina Law. Questions regarding these permits should be addressed to the Regional Office indicated on the reverse of the form. All applications, information and guidelines relative to these plans and permits are available from the same Regional Office.

			Normal Process Time (statutory time limit)
	PERMITS	SPECIAL APPLICATION PROCEDURES or REQUIREMENTS	
<input type="checkbox"/>	Permit to construct & operate wastewater treatment facilities, sewer system extensions & sewer systems not discharging into state surface waters.	Application 90 days before begin construction or award of construction contracts. On-site inspection. Post-application technical conference usual.	30 days (90 days)
<input type="checkbox"/>	NPDES - permit to discharge into surface water and/or permit to operate and construct wastewater facilities discharging into state surface waters.	Application 180 days before begin activity. On-site inspection. Pre-application conference usual. Additionally, obtain permit to construct wastewater treatment facility-granted after NPDES. Reply time, 30 days after receipt of plans or issue of NPDES permit-whichever is later.	90-120 days (N/A)
<input type="checkbox"/>	Water Use Permit	Pre-application technical conference usually necessary	30 days (N/A)
<input type="checkbox"/>	Well Construction Permit	Complete application must be received and permit issued prior to the installation of a well.	7 days (15 days)
<input type="checkbox"/>	Dredge and Fill Permit	Application copy must be served on each adjacent riparian property owner. On-site inspection. Pre-application conference usual. Filling may require Easement to Fill from N.C. Department of Administration and Federal Dredge and Fill Permit.	55 days (90 days)
<input type="checkbox"/>	Permit to construct & operate Air Pollution Abatement facilities and/or Emission Sources as per 15 A NCAC (2Q.0100, 2Q.0300, 2H.0600)	N/A	60 days
<input checked="" type="checkbox"/>	Any open burning associated with subject proposal must be in compliance with 15 A NCAC 2D.1900	N/A	60 days (90 days)
<input type="checkbox"/>	Demolition or renovations of structures containing asbestos material must be in compliance with 15 A NCAC 2D.1110 (a) (1) which requires notification and removal prior to demolition. Contact Asbestos Control Group 919-733-0820.		
<input type="checkbox"/>	Complex Source Permit required under 15 A NCAC 2D.0800		
<input checked="" type="checkbox"/>	The Sedimentation Pollution Control Act of 1973 must be properly addressed for any land disturbing activity. An erosion & sedimentation control plan will be required if one or more acres to be disturbed. Plan filed with proper Regional Office (land Quality Sect.) At least 30 days before beginning activity. A fee of \$30 for the first acre and \$2000 for each additional acre or part must accompany the plan.		20 days (30 days)
<input type="checkbox"/>	The Sedimentation Pollution control Act of 1973 must be addressed with respect to the referenced Local Ordinance.		(30 days)
<input type="checkbox"/>	Mining Permit	On-site inspection usual. Surety bond filed with ENR. Bond amount varies with type mine and number of acres of affected land. Any are mined greater than one acre must be permitted. The appropriate bond must be received before the permit can be issued.	30 days (60 days)
<input type="checkbox"/>	North Carolina Burning permit	On-site inspection by N.C. Division Forest Resources if permit exceeds 4 days	1 day (N/A)
<input type="checkbox"/>	Special Ground Clearance Burning Permit - 22 counties in coastal N.C. with organic soils	On-site inspection by N.C. Division Forest Resources required "if more than five acres of ground clearing activities are involved. Inspections should be requested at least ten days before actual burn is planned."	1 day (N/A)
<input type="checkbox"/>	Oil Refining Facilities	N/A	90-120 days (N/A)
<input type="checkbox"/>	Dam Safety Permit	If permit required, application 60 days before begin construction. Applicant must hire N.C. qualified engineer to: prepare plans, inspect construction, certify construction is according to ENR approved plans. May also require permit under mosquito control program. And a 404 permit from Corps of Engineers. An inspection of site is necessary to verify Hazard Classification. A minimum fee of \$200.00 must accompany the application. An additional processing fee based on a percentage of the total project cost will be required upon completion.	30 days (60 days)

PERMITS		SPECIAL APPLICATION PROCEDURES or REQUIREMENTS	Normal Process Time (statutory time limit)
<input type="checkbox"/>	Permit to drill exploratory oil or gas well	File surety bond of \$5,000 with ENR running to State of NC conditional that any well opened by drill operator shall, upon abandonment, be plugged according to ENR rules and regulations.	10 days (N/A)
<input type="checkbox"/>	Geophysical Exploration Permit	Application filed with ENR at least 10 days prior to issue of permit. Application by letter. No standard application form.	10 days (N/A)
<input type="checkbox"/>	State Lakes Construction Permit	Application fee based on structure size is charged. Must include descriptions & drawings of structure & proof of ownership of riparian property.	15-20 days (N/A)
<input checked="" type="checkbox"/>	401 Water Quality Certification	N/A	60 days (130 days)
<input type="checkbox"/>	CAMA Permit for MAJOR development	\$250.00 fee must accompany application	55 days (150 days)
<input type="checkbox"/>	CAMA Permit for MINOR development	\$50.00 fee must accompany application	22 days (25 days)
<input type="checkbox"/>	Several geodetic monuments are located in or near the project area. If any monuments need to be moved or destroyed, please notify: N.C. Geodetic Survey, Box 27687, Raleigh, NC 27611		
<input type="checkbox"/>	Abandonment of any wells, if required must be in accordance with Title 15A, Subchapter 2C.0100.		
<input type="checkbox"/>	Notification of the proper regional office is requested if "orphan" underground storage tanks (USTS) are discovered during any excavation operation.		
<input type="checkbox"/>	Compliance with 15A NCAC 2H 1000 (Coastal Stormwater Rules) is required.		45 days (N/A)
*	Other comments (attach additional pages as necessary, being certain to cite comment authority)		

## REGIONAL OFFICES

Questions regarding these permits should be addressed to the Regional Office marked below.

- |  |  |
|--|--|
| <input type="checkbox"/> Asheville Regional Office<br>59 Woodfin Place<br>Asheville, NC 28801<br>(704) 251-6208                        | <input type="checkbox"/> Fayetteville Regional Office<br>Suite 714 Wachovia Building<br>Fayetteville, NC 28301<br>(919) 486-1541         |
| <input type="checkbox"/> Mooresville Regional Office<br>919 North Main Street, P.O. Box 950<br>Mooresville, NC 28115<br>(704) 663-1699 | <input type="checkbox"/> Raleigh Regional Office<br>3800 Barrett Drive, Suite 101<br>Raleigh, NC 27609<br>(919) 571-4700                 |
| <input type="checkbox"/> Washington Regional Office<br>943 Washington Square Mall<br>Washington, NC 27889<br>919) 946-6481             | <input checked="" type="checkbox"/> Wilmington Regional Office<br>127 Cardinal Drive Extension<br>Wilmington, NC 28405<br>(919) 395-3900 |
| <input type="checkbox"/> Winston-Salem Regional Office<br>585 Waughtown St.<br>Winston-Salem, NC 27107<br>(910) 771-4600               |  |



Action: PM  
CF: DE  
DX  
TS  
DP

## North Carolina Department of Commerce

James B. Hunt Jr., Governor

Rick Carlisle, Secretary

March 16, 2000

James W. DeLony  
Colonel, US Army  
District Engineer  
Department of the Army  
Wilmington District, Corps of Engineers  
PO Box 1890  
Wilmington, NC 28402-1890

Dear Colonel DeLony:

As Secretary of Commerce, I can attest to the important role that the Port of Wilmington plays in economic development for the state of North Carolina. The Port serves as a gateway to global markets for North Carolina's business, industry and consumers. The deepening of the Cape Fear navigation channel from 38 feet to 42 feet would allow the Port to keep current customers and to be competitive in attracting new business. This could mean more jobs and tax revenues for our citizens.

Therefore, I would like to offer my support for the U.S. Army Corps of Engineers' Finding of No Significant Impact for the draft Environmental Assessment. The Wilmington Harbor Project has the potential to yield both economic and environmental benefits for North Carolina. It is my hope that this project will move forward.

Thank you for your consideration of my letter. If I may be of further assistance, please do not hesitate to contact me at (919) 733-3449.

Sincerely,

A handwritten signature in cursive script, appearing to read "Rick Carlisle".

Rick Carlisle





## ☒ North Carolina Wildlife Resources Commission ☒

Charles R. Fullwood, Executive Director

March 29, 2000

TO: Melba McGee  
Office of Legislative and Intergovernmental Affairs

FROM: Franklin T. McBride, Manager *Franklin T. McBride*  
Habitat Conservation Program

SUBJECT: Environmental Assessment (EA) for Pre-construction Modifications of  
Authorized Improvements to Wilmington Harbor, New Hanover and Brunswick  
Counties, North Carolina. Project Number: 00E-0399.

The North Carolina Wildlife Resources Commission has reviewed the project for impacts to wildlife and fishery resources. Our comments are provided in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), Section 401 of the Clean Water Act (as amended), and North Carolina General Statutes (G.S. 113-131 et seq.).

The EA describes modifications to the 1998 Wilmington Harbor, North Carolina, 96 Act, a federal project connecting port facilities in Wilmington to deep water of the Atlantic Ocean by way of a 37-mile channel in the Cape Fear and Northeast Cape Fear Rivers. The modifications include: excavation of a new channel alignment through the ocean bar at the Cape Fear River mouth, backfilling the abandoned ocean bar channel, placement of suitable sand dredged from ocean bar and riverine channels on area beaches, disposal of dredged material not suitable for placement on beaches in a designated ocean disposal area, elimination of bubble curtains to mitigate the effects of blasting on estuarine animals, and expansion of dredging methods.

### General Comments

The EA fails to address the cumulative impacts of this project with other beach disposal projects that are either on-going (Kure Beach, Carolina Beach, Wrightsville Beach and Masonboro Island) or still in the planning stages (Ocean Isle Beach, Holden Beach, Oak Island, Figure Eight Island, Onslow Beach, Bogue Banks and Dare County). Combined, these projects

cover over 80 miles of coastline. This could have significant impacts on fish and wildlife resources, particularly if they are carried out within a few years of one another.

It is well understood that coastal development has many adverse impacts on the beach ecosystem. The EA fails to acknowledge that the project's beach disposal plan will, at a minimum, sustain the current level of development in Brunswick County. However, the more likely scenario is that it will encourage additional development in the maintenance disposal areas located on Bald Head Island and Caswell Beach. Furthermore, the one-time disposal slated for the Brunswick County beaches outside of the maintenance disposal area may afford those communities the time necessary to enroll in the long-term Federal Shore Protection Program provided that there is sufficient sand available to warrant such efforts. If that is the case, the project will serve to increase the amount of coastline that will undergo regular beach nourishment activities and potentially increase the level of development on those beaches.

Past beach nourishment projects in North Carolina have been implicated with inlet migration. For this reason the Corps of Engineers should be prepared to answer questions pertaining to actions to be taken if inlet migration is accelerated by this large amount of material that will be placed in the littoral zones of Brunswick County beaches. In fact, this information should be included in the environmental documentation so cumulative impacts can be adequately assessed.

## **Specific Comments**

### **Channel Blasting**

According to the EA, blasting tests conducted for the project in 1998 and 1999 indicated that air bubble curtains are not effective in reducing blasting impacts on aquatic life. However, Appendix B (Analysis of Test Blast Results) on page B-3 reports a 16% reduction in apparent survival (loss of equilibrium) for caged striped bass, mullet, and killifish located 70 feet away from the blast site without a bubble curtain. While we can appreciate the cost and logistical difficulty of deploying bubble curtains, we question whether they can be summarily dismissed as "not effective". There was indeed greater survival of more laterally compressed (hence more susceptible to blast injury) species like striped bass when a bubble curtain was deployed. Since anadromous river herring, hickory shad, and American shad exhibit greater lateral compression than striped bass, we expect these untested species would be more vulnerable to blast injury than striped bass. The proposed blasting window of August 1 through January 31 should avoid impacting spawning and larval anadromous species, but out-migrating adults and juveniles may be impacted during late summer and early fall despite the reduced blasting area anticipated.

Although reducing blast area, stemming blast holes, and time-delaying blasts should serve to reduce fish mortalities, some mortality will still likely occur. Therefore, we strongly recommend that blast-induced fish mortality be treated like any other fish kill having a known cause. Dead and dying fish should be picked up, identified to species, measured (length) and counted so that replacement costs can be calculated. Size and abundance of small fish like anchovies that are quickly ingested by birds following a blast could be estimated. Quantification

of fish mortality would do two important things: (1) allow fish replacement costs to be assessed for this specific project and (2) provide real blasting impact data that can be used to assess future channel blasting impacts in North Carolina.

#### Beach-Using Birds

Although we have little data on the use of the beaches in question by listed piping plovers during migration, we know the use is considerably higher than during the winter or breeding seasons. The EA states that deposition on Bald Head Island, part of Oak Island and Holden Beach (where we know wintering and migrating piping plovers are found) will receive dredged material during colder months. For this reason we recommend a monitoring regime to assess the numbers and locations of piping plovers in the project area throughout the non-breeding season in the project area (Bald Head Island, Caswell Beach, Oak Island, Holden Beach). Although somewhat less use of the area is expected in winter than during migration, little is also known about this time period. Information from these surveys can be used to help avoid impacts to the birds by reducing disturbance from tractors, pipelines and other activities or equipment. One survey of the entire area each month should be sufficient. There is no need to survey areas where the beach has moved so that structures (houses) are below high tide. These results should be reported to the NCWRC to be included in the piping plover database.

The EA states that after dredge material deposition, the affected beach should recover (from a macro-invertebrate standpoint) within one to two years after deposition. Since maintenance dredging of the channel will be needed every two years, and that material will go to Bald Head Island and Caswell Beach, these beaches will be unproductive for shorebird foraging most of the time. Furthermore, since many other beach nourishment projects have occurred recently or are planned in the near future, a more in depth look at cumulative impacts to beach macro-invertebrates is needed.

As planned, Bald Head Island (West Beach and South Beach) will be nourished during the non-breeding season for nesting terns. If by chance schedules are disrupted and Bald Head has activities associated with this project during the bird nesting season, it should be surveyed for least tern nesting activity, and these nesting colonies should be avoided.

#### Sea Turtles

There are three main issues with regard to the Wilmington Harbor Realignment Project's (hereafter referred to as the Project) impact on sea turtles. The first involves the disposal of sand on sea turtle nesting beaches and the second involves the continuous use of a hopper dredge in the lower harbor and new ocean bar channel for an 18-month period. A third issue involves potential impacts to turtles from the ocean bar channel relocation. Each concern is discussed below.

##### *Disposal of Sand on Sea Turtle Nesting Beaches*

North Carolina's ocean-facing beaches provide important nesting habitat for several sea turtle species. Loggerheads (*Caretta caretta*) are regular nesters on the state's ocean-facing

beaches and lay an average of 600 nests per year. Since 1989, between 34% to 49% of the state's annual loggerhead nesting activity occurred on Brunswick County beaches. Green turtles (*Chelonia mydas*) nest intermittently in North Carolina. Over 75 green turtle nests have been recorded in this state since 1980, of which 20 were deposited on Brunswick County beaches. In 1992, a Kemp's ridley (*Lepidochelys kempii*) nest was laid on Oak Island, Brunswick County. And finally, our state's first record of a leatherback (*Dermochelys coriacea*) nest dates back to 1966 when a number of leatherback hatchlings were found at Cape Lookout National Seashore on the south end of South Core Banks (Palmer and Braswell 1995). In 1998, at least two leatherback nests were laid at Cape Hatteras National Seashore on the south end of Hatteras Island near Avon (is not known whether a third crawl found in the same area resulted in a nest).

It has recently been discovered that the loggerheads that nest in North Carolina belong to a genetically distinct United States nesting assemblage known as the Northern Nesting Subpopulation (NNS), whose range extends from the North Carolina/Virginia border to approximately Cape Canaveral, Florida (TEWG 1998). Because the NNS is a genetically separate subpopulation, regional dispersal of loggerheads is not sufficient to replenish the nesting assemblage should it be extirpated. At this point it is not clear whether NNS is declining or holding stable. Either way, given that the current average of 6,200 per year has not increased noticeably since the late 1980's, it appears unlikely that the NNS's recovery goal of 12,800 nests will be achieved in the foreseeable future (TEWG 1998). As such, all adverse impacts on loggerhead nesting activity in North Carolina have taken on a far greater biological significance and should be afforded much more consideration than they have in the past.

There are several concerns associated with the Project's proposed disposal of beach quality sand on sea turtle nesting beaches (hereafter referred to as beach nourishment). The first involves the direct impacts resulting from disposal during the nesting season. According to the EA, beach nourishment will be conducted up to a continuous 18-month period, which will encompass one entire nesting season and at least part of another. Beach nourishment requires the presence of a large pipeline as well as heavy equipment on the beach. Such large obstructions impede nesting females' access to the base of the primary dune where they typically nest. Additionally, the sand slurry that is deposited on the beach is unsuitable for nesting and more importantly, may bury existing nests in the disposal area. A loss of nests can occur even with highly trained nest monitors patrolling the disposal site. Under normal survey conditions, it is estimated that even the most experienced nest monitors (Schroeder 1994) miss up to seven percent of the nests. One could expect the percentage of missed nests to increase due to beach nourishment activities that often obscure crawls (e.g., broadcasting of sand slurry, frequent movement of heavy equipment and pipes). Furthermore, all nests laid in the disposal area will require relocation. The moving of nests may reduce hatching success (Limpus et al. 1979). Additionally, nest relocation often alters the eggs' incubation environment significantly, which may effect the physical character of emergent hatchlings (i.e., hatchling size and weight, embryonic and post-hatchling growth rates, swimming ability and endurance) and ultimately the hatchlings' survivability (Foley 1998). The EA does not offer any information with regard to the amount of equipment and pipeline that will be on the beach at any given time other than a brief comment that approximately one mile of beach per month will be affected by nourishment activities. Nor does the EA explain how the equipment will be moved and repositioned to minimize impacts on nesting turtles. Additionally, the proposed nourishment activities will



involve around-the-clock disposal during the nesting season, which will require the use of lights on the beach to maintain an acceptable level of safety for the workers. It is well understood that artificial lighting causes disorientation among hatchlings and results in high hatchling mortality (Witherington and Martin 1996). Furthermore, artificial lighting can deter nesting females from coming ashore to nest. The EA does not address lighting impacts nor does it explain how they will be minimized.

Another related concern is the impact beach nourishment will have on future nesting activity in Brunswick County. Several studies conducted in Florida, which examined the effects of beach renourishment on nesting success, revealed an increase in non-nesting emergence (false crawl) ratios (Lund 1986; Bagley et al. 1994) and a reduction in the nesting proportions (nests / nests + false crawls; Crain et al. 1995; Steinitz 1996) while other studies revealed no significant differences in nest to false crawl ratios (Ryder 1993; Ehrhart 1995). The studies that reported significant decreases in nesting success attributed the reduction to increased escarpment formation, increased compaction levels, and/or other changes in the beaches' physical characteristics. Many of these same studies, along with others (Crain et al. 1995) reported that nesting activity returned to pre-nourishment levels after a period of one to four years or the length of time it took for beaches to regain their natural profile and sand characteristics (hereafter referred to as recovery). These findings have serious implications for those beaches within the Project's maintenance disposal area (i.e., Bald Head Island and Caswell Beach) slated to undergo regular nourishment (Magron and Parkinson 2000). Currently, the Corps proposes to perform maintenance dredging every two years. Bald Head Island will receive dredge material from two consecutive maintenance cycles while Caswell Beach will receive sand every third cycle (every six years). At this point, it is difficult to predict how long it will take for each beach to recover from a nourishment cycle. Therefore, we strongly recommend that the Corps carefully monitor each site to establish the length of their recovery periods. Once that information is available, the Corps will be able to adjust the disposal schedule to optimize nesting success in both areas.

It is not clear what effect beach nourishment has on the quality of turtle nesting habitat (Crain et al. 1995). For example, the deposition of sand may change the beach's sand color thereby affecting sand temperature. Because sea turtles exhibit temperature-dependent sex determination, beach nourishment could alter sex ratios of nests deposited in nourished areas. Beach nourishment may influence other physical characteristics of beaches such as sand-grain size and shape, silt-clay content, sand compaction, moisture content, porosity/water retention and gas diffusion rates. The altering of one or more of these physical characteristics may not necessarily impact beach selection by nesting females (Crain et al. 1995) but may reduce reproductive success of nests laid in nourished areas (Ackerman 1996). Moreover, such alterations may affect the fitness and survivability of emergent hatchlings (Foley 1998). There is little to no information available on the effects of beach nourishment on the quality of nesting habitat in North Carolina. As such, the Corps should consider revising their current sea turtle nesting monitoring protocol to include the collection of additional data that would help to address some of the potential impacts listed above. The North Carolina Wildlife Resources Commission is willing to assist with the development of a new monitoring protocol.

### *Hopper Dredging Impacts on Sea Turtles*

North Carolina's inshore and nearshore waters provide important developmental habitat for immature loggerheads, greens, and Kemp's ridleys virtually year round (Epperly et al. (1995). Leatherbacks are known to occur in our nearshore waters primarily in May and June as they migrate north along the Atlantic Coast. Leatherbacks have also been sighted intermittently in Cape Lookout Bight and less frequently in Core and Pamlico Sounds. Hawksbills (*Eretmochelys imbricata*) are very rare in North Carolina with only three confirmed sighting on record, one of which was found in the Cape Fear River (Sheryan Epperly, NMFS, personal communication). Stranding data collected in Brunswick County by the North Carolina Sea Turtle Stranding and Salvage Network suggest that the period of highest turtle abundance in the project area extends from May – September. However, inlets such as the one located at the mouth of the Cape Fear River, may have increased sea turtle abundance during migration periods because they serve as travel corridors for the immigration of turtles into warming inshore waters in the Spring (April – June) and subsequent emigration out of cooling inshore waters in the Fall (October – December).

Hopper dredges are known to take sea turtles in state waters. Unfortunately, the EA does not provide any of the incidental take data collected in North Carolina. Furthermore, it does not include any of the incidental capture data the Corps collected during its 1997 debris removal project in the Wilmington Harbor whereby TED-less shrimp trawlers were deployed to collect debris that accumulated in the harbor following Hurricanes Bertha and Fran. The inclusion of these data would have offered good information on the extent of hopper dredge-related mortality in North Carolina as well as provide additional information on sea turtle abundance within the project area. Statewide stranding data show that the majority of Kemp's ridleys and green turtles that occur in state waters are juveniles with a mean straight carapace length of 33.5 cm (SD  $\pm$  8.9 cm) and 30.3 cm (SD  $\pm$  8.0 cm), respectively. There is a concern that onboard observers will not be able to detect the presence of parts from small turtles that succumb to hopper dredging activities. Therefore, we ask the Corps to provide size class information on past Kemp's ridley and green turtle takes as well as provide any additional assurances that small turtle takes will not go undetected by onboard observers.

### *Turtle Impacts From A Relocated Ocean Channel*

In addition to the two issues discussed above, there is one more that may have long-term impacts on sea turtles; the moving of the ocean bar channel closer to the Wilmington Offshore Fisheries Enhancement Structure (WOFES). The EA states that there may a rise in turtle takes during the construction and maintenance of the new channel because of its increased proximity to WOFES, which supports a reef-like community that may attract turtles. If turtles do congregate in the vicinity of WOFES, they may also stand a greater chance of getting struck by propellers from large ships utilizing the channel. It is not uncommon for turtles that have been cut in half to strand on beaches adjacent to major shipping channels. The cause of these strandings has often been attributed to ship propeller strikes (Wendy Teas, NMFS, personal communication). The EA does not acknowledge this potential long-term impact on sea turtles.

A final concern is the potential for the new channel alignment to accelerate beach erosion along southwestern Bald Head Island, resulting in a loss of sea turtle nesting habitat in this area. The wave transformation analysis described on p. 27 of the EA predicts no difference in

sediment transport potential associated with the new alignment, but we question whether this accounts for increased tidal (water) velocity closer to this beach.

It should be obvious that we have a number of concerns with the EA. We recommend that these concerns be fully addressed in the next environmental document, be it a revised EA or Environmental Impact Statement. Thank you for the opportunity to comment. If you have questions, please call David Allen (252 448-1546), Ruth Boettcher (252 729-1359), or Bennett Wynne at (252) 522-9736.

Cc: David Allen, NCWRC  
Ruth Boettcher, NCWRC  
Howard Hall, USFWS  
Ron Sechler, NMFS  
Fritz Rohde, NCDMF  
Frank Yelverton, USACOE

#### Literature Cited

- Ackerman, R.A. 1996. The nest environment and the embryonic development of sea turtles. Pp. 83-106 in *The Biology of Sea Turtles* (Lutz, P.L. and J.A. Musick, eds.). Boca Raton, FL, CRC Press.
- Bagley, D.T., R. Owen, S. Johnson, L. Ehrhardt. 1994. Marine turtle nesting at Patrick Air Force Base, Florida; 1987 – 1993: Trends and Issues. Pp. 180 – 181, In “proceedings of the 14<sup>th</sup> Annual Symposium on Sea Turtle Biology and Conservation. Technical Memorandum NMFS-SEFC 351. National Oceanic and Atmospheric Administration, Washington DC.
- Crain, D.A., A.B. Bolten, and K.A. Bjorndal. 1995. Effects of beach nourishment on sea turtles: Review and research initiatives. *Restoration Ecology* 3(2):95-104.
- Ehrhardt, L.M. 1995. The relationship between marine turtle nesting and reproductive success and the beach renourishment project at Sabastian Inlet, Florida, in 1994. Technical report to the Florida Institute of Technology.
- Epperly, S.P., J. Braun, and A. Vieshlow. 1995. Sea turtles in North Carolina waters. *Conservation Biology* 9:385-394.
- Foley, A.M. 1998. The nesting ecology of loggerhead turtles (*Caretta caretta*) in the Ten Thousand Islands, Florida. Ph.D. dissertation, University of South Florida, Tampa, FL. 164 Pp.

- Limpus, C.J., V. Baker, and J.D. Miller. 1979. Movement induced mortality of loggerhead eggs. *Herpetologica* 35(4):335-338.
- Lund, F. 1986. Impacts of beach renourishment programs upon marine turtle nesting at Jupiter Island, Florida, 1969 - 1983. Report to the town of Jupiter Island. Hobe Sound, FL. Pp. 1 - 9.
- Magron J.R. and R.W. Parkinson. *Submitted for publication*. Potential effect of long-term upland sand deposition on Florida high-density nesting beaches. *In* Proceeding of the 20<sup>th</sup> Annual Symposium on Sea Turtle Conservation and Biology, Orlando, FL.
- Palmer, W.M. and A.L. Braswell. 1995. Reptiles of North Carolina. Chapel Hill, NC, The University of North Carolina Press.
- Ryder, C.E. 1993. The effects of beach renourishment on sea turtle nesting and hatching success at Sabastian Inlet State Recreation Area East-Central, Florida. MS thesis, Virginia Polytechnic Institute and State University, Blacksberg, VA. Pp. 1 - 109.
- Schroeder, B.A. 1994. Florida index nesting beach surveys: are we on the right track? Pp. 132-133 *in* Proceedings of the 14<sup>th</sup> Annual Symposium on Sea Turtle Biology and Conservation (Bjorndal, K.A., A.B. Bolten, D.A. Johnson, and P.J. Eliazar, compilers). NOAA Technical Memorandum NMFS-SEFSC-351.
- Steinitz, M.J. 1996. The effects of beach renourishment on the nesting behavior and hatching success of the loggerhead sea turtle on Jupiter Island, Florida: a seven year study. MS thesis, Florida Atlantic University, Boca Raton, Florida. Pp. 1 - 88.
- Turtle Expert Working Group. 1998. An assessment of the Kemp's ridley (*Lepidochelys kempii*) and loggerhead (*Caretta caretta*) sea turtle populations in the western North Atlantic. NOAA Technical Memorandum NMFS-SEFSC-409. 96 Pp.
- Witherington, B.E. and R.E. Martin. 1996. Understanding, assessing, and, resolving light-pollution problems on sea turtle nesting beaches. Florida Marine Research Institute Technical Report TR-2. 73 Pp.



## North Carolina Wildlife Resources Commission

512 N. Salisbury Street, Raleigh, North Carolina 27604-1188, 919-733-3391  
Charles R. Fullwood, Executive Director  
March 31, 2000

TO: Frank Yelverton  
Army Corps of Engineers

FROM: Frank McBride  
Habitat Conservation Program

SUBJECT: Public Notice for an Environmental Assessment (EA) for Pre-construction  
Modifications of Authorized Improvements to Wilmington Harbor, New Hanover  
and Brunswick Counties, North Carolina. CESAW-TS-PE-00-65-0003.

The North Carolina Wildlife Resources Commission has reviewed the project for impacts to wildlife and fishery resources. Our comments are provided in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), Section 401 of the Clean Water Act (as amended), and North Carolina General Statutes (G.S. 113-131 et seq.).

The EA describes modifications to the 1998 Wilmington Harbor, North Carolina, 96 Act, a federal project connecting port facilities in Wilmington to deep water of the Atlantic Ocean by way of a 37-mile channel in the Cape Fear and Northeast Cape Fear Rivers. The modifications include: excavation of a new channel alignment through the ocean bar at the Cape Fear River mouth, backfilling the abandoned ocean bar channel, placement of suitable sand dredged from ocean bar and riverine channels on area beaches, disposal of dredged material not suitable for placement on beaches in a designated ocean disposal area, elimination of bubble curtains to mitigate the effects of blasting on estuarine animals, and expansion of dredging methods.

### **General Comments**

The EA fails to address the cumulative impacts of this project with other beach disposal projects that are either on-going (Kure Beach, Carolina Beach, Wrightsville Beach and Masonboro Island) or still in the planning stages (Ocean Isle Beach, Holden Beach, Oak Island, Figure Eight Island, Onslow Beach, Bogue Banks and Dare County). Combined, these projects cover over 80 miles of coastline. This could have significant impacts on fish and wildlife resources, particularly if they are carried out within a few years of one another.

It is well understood that coastal development has many adverse impacts on the beach ecosystem. The EA fails to acknowledge that the project's beach disposal plan will, at a minimum, sustain the current level of development in Brunswick County. However, the more likely scenario is that it will encourage additional development in the maintenance disposal areas located on Bald Head Island and Caswell Beach. Furthermore, the one-time disposal slated for the Brunswick County beaches outside of the maintenance disposal area may afford those communities the time necessary to enroll in the long-term Federal Shore Protection Program provided that there is sufficient sand available to warrant such efforts. If that is the case, the project will serve to increase the amount of coastline that will undergo regular beach nourishment activities and potentially increase the level of development on those beaches.

Past beach nourishment projects in North Carolina have been implicated with inlet migration. For this reason the Corps of Engineers should be prepared to answer questions pertaining to actions to be taken if inlet migration is accelerated by the large amount of material placed in the littoral zones of Brunswick County beaches. In fact, this information should be included in the environmental documentation so cumulative impacts can be adequately assessed.

### **Specific Comments**

#### **Channel Blasting**

According to the EA, blasting tests conducted for the project in 1998 and 1999 indicated that air bubble curtains are not effective in reducing blasting impacts on aquatic life. However, Appendix B (Analysis of Test Blast Results) on page B-3 reports a 16% reduction in apparent survival (loss of equilibrium) for caged striped bass, mullet, and killifish located 70 feet away from the blast site without a bubble curtain. While we can appreciate the cost and logistical difficulty of deploying bubble curtains, we question whether they can be summarily dismissed as "not effective". There was indeed greater survival of more laterally compressed (hence more susceptible to blast injury) species like striped bass when a bubble curtain was deployed. Since anadromous river herring, hickory shad, and American shad exhibit greater lateral compression than striped bass, we expect these untested species would be more vulnerable to blast injury than striped bass. The proposed blasting window of August 1 through January 31 should avoid impacting spawning and larval anadromous species, but out-migrating adults and juveniles may be impacted during late summer and early fall despite the reduced blasting area anticipated.

Although reducing blast area, stemming blast holes, and time-delaying blasts should serve to reduce fish mortalities, some mortality will still likely occur. Therefore, we strongly recommend that blast-induced fish mortality be treated like any other fish kill having a known cause. Dead and dying fish should be picked up, identified to species, measured (length) and counted so that replacement costs can be calculated. Size and abundance of small fish like anchovies that are quickly ingested by birds following a blast could be estimated. Quantification of fish mortality would do two important things: (1) allow fish replacement costs to be assessed for this specific project and (2) provide real blasting impact data that can be used to assess future channel blasting impacts in North Carolina.

### Beach-Using Birds

Although we have little data on the use of the beaches in question by listed piping plovers during migration, we know the use is considerably higher than during the winter or breeding seasons. The EA states that deposition on Bald Head Island, part of Oak Island and Holden Beach (where we know wintering and migrating piping plovers are found) will receive dredged material during colder months. For this reason we recommend a monitoring regime to assess the numbers and locations of piping plovers in the project area throughout the non-breeding season in the project area (Bald Head Island, Caswell Beach, Oak Island, Holden Beach). Although somewhat less use of the area is expected in winter than during migration, little is also known about this time period. Information from these surveys can be used to help avoid impacts to the birds by reducing disturbance from tractors, pipelines and other activities or equipment. One survey of the entire area each month should be sufficient. There is no need to survey areas where the beach has moved so that structures (houses) are below high tide. These results should be reported to the NCWRC to be included in the piping plover database.

The EA states that after dredge material deposition, the affected beach should recover (from a macro-invertebrate standpoint) within one to two years after deposition. Since maintenance dredging of the channel will be needed every two years, and that material will go to Bald Head Island and Caswell Beach, these beaches will be unproductive for shorebird foraging most of the time. Furthermore, since many other beach nourishment projects have occurred recently or are planned in the near future, a more in depth look at cumulative impacts to beach macro-invertebrates is needed.

As planned, Bald Head Island (West Beach and South Beach) will be nourished during the non-breeding season for nesting terns. If by chance schedules are disrupted and Bald Head has activities associated with this project during the bird nesting season, it should be surveyed for least tern nesting activity, and these nesting colonies should be avoided.

### Sea Turtles

There are three main issues with regard to the Wilmington Harbor Realignment Project's (hereafter referred to as the Project) impact on sea turtles. The first involves the disposal of sand on sea turtle nesting beaches and the second involves the continuous use of a hopper dredge in the lower harbor and new ocean bar channel for an 18-month period. A third issue involves potential impacts to turtles from the ocean bar channel relocation. Each concern is discussed below.

#### *Disposal of Sand on Sea Turtle Nesting Beaches*

North Carolina's ocean-facing beaches provide important nesting habitat for several sea turtle species. Loggerheads (*Caretta caretta*) are regular nesters on the state's ocean-facing beaches and lay an average of 600 nests per year. Since 1989, between 34% to 49% of the state's annual loggerhead nesting activity occurred on Brunswick County beaches. Green turtles (*Chelonia mydas*) nest intermittently in North Carolina. Over 75 green turtle nests have been recorded in this state since 1980, of which 20 were deposited on Brunswick County beaches. In 1992, a



Kemp's ridley (*Lepidochelys kempii*) nest was laid on Oak Island, Brunswick County. And finally, our state's first record of a leatherback (*Dermochelys coriacea*) nest dates back to 1966 when a number of leatherback hatchlings were found at Cape Lookout National Seashore on the south end of South Core Banks (Palmer and Braswell 1995). In 1998, at least two leatherback nests were laid at Cape Hatteras National Seashore on the south end of Hatteras Island near Avon (is not known whether a third crawl found in the same area resulted in a nest).

It has recently been discovered that North Carolina loggerhead nesters belong to a genetically distinct United States nesting assemblage known as the Northern Nesting Subpopulation (NNS), whose range extends from the North Carolina/Virginia border to approximately Cape Canaveral, Florida (TEWG 1998). Because the NNS is a genetically separate subpopulation, regional dispersal of loggerheads is not sufficient to replenish the nesting assemblage should it be extirpated. At this point it is not clear whether NNS is declining or holding stable. Either way, given that the current average of 6,200 per year has not increased noticeably since the late 1980's, it appears unlikely that the NNS's recovery goal of 12,800 nests will be achieved in the foreseeable future (TEWG 1998). As such, all adverse impacts on loggerhead nesting activity in North Carolina have taken on a far greater biological significance and therefore should be afforded much more consideration than they have in the past.

There are several concerns associated with the Project's proposed disposal of beach quality sand on sea turtle nesting beaches (hereafter referred to as beach nourishment). The first involves the direct impacts resulting from disposal during the nesting season. According to the EA, beach nourishment will be conducted up to a continuous 18-month period, which will encompass one entire nesting season and at least part of another. Beach nourishment requires the presence of a large pipeline as well as heavy equipment on the beach. Such large obstructions impede nesting females' access to the base of the primary dune where they typically nest. Additionally, the sand slurry that is deposited on the beach is unsuitable for nesting and more importantly, may bury existing nests in the disposal area. A loss of nests can occur even with highly trained nest monitors patrolling the disposal site. Under normal survey conditions, it is estimated that even the most experienced nest monitors (Schroeder 1994) miss up to seven percent of the nests. One could expect the percentage of missed nests to increase due to beach nourishment activities that often obscure crawls (e.g., broadcasting of sand slurry, frequent movement of heavy equipment and pipes). Furthermore, all nests laid in the disposal area will require relocation. The moving of nests may reduce hatching success (Limpus et al. 1979). Additionally, nest relocation often alters the eggs' incubation environment significantly, which may effect the physical character of emergent hatchlings (i.e., hatchling size and weight, embryonic and post-hatchling growth rates, swimming ability and endurance) and ultimately the hatchlings' survivability (Foley 1998). The EA does not offer any information with regard to the amount of equipment and pipeline that will be on the beach at any given time other than a brief comment that approximately one mile of beach per month will be affected by nourishment activities. Nor does the EA explain how the equipment will be moved and repositioned to minimize impacts on nesting turtles. Additionally, the proposed nourishment activities will involve around-the-clock disposal during the nesting season, which will require the use of lights on the beach to maintain an acceptable level of safety for the workers. It is well understood that artificial lighting causes disorientation among hatchlings and results in high hatchling mortality (Witherington and Martin 1996). Furthermore, artificial

lighting can deter nesting females from coming ashore to nest. The EA does not address lighting impacts nor does it explain how they will be minimized.

Another related concern is the impact beach nourishment will have on future nesting activity in Brunswick County. Several studies conducted in Florida, which examined the effects of beach renourishment on nesting success, revealed an increase in non-nesting emergence (false crawl) ratios (Lund 1986; Bagley et al. 1994) and a reduction in the nesting proportions (nests / nests + false crawls; Crain et al. 1995; Steinitz 1996) while other studies revealed no significant differences in nest to false crawl ratios (Ryder 1993; Ehrhart 1995). The studies that reported significant decreases in nesting success attributed the reduction to increased escarpment formation, increased compaction levels, and/or other changes in the beaches' physical characteristics. Many of these same studies, along with others (Crain et al. 1995) reported that nesting activity returned to pre-nourishment levels after a period of one to four years or the length of time it took for beaches to regain their natural profile and sand characteristics (hereafter referred to as recovery). These findings have serious implications for those beaches within the Project's maintenance disposal area (i.e., Bald Head Island and Caswell Beach) slated to undergo regular nourishment (Magron and Parkinson 2000). Currently, the Corps proposes to perform maintenance dredging every two years. Bald Head Island will receive dredge material from two consecutive maintenance cycles while Caswell Beach will receive sand every third cycle (every six years). At this point, it is difficult to predict how long it will take for each beach to recover from a nourishment cycle. Therefore, we strongly recommend that the Corps carefully monitor each site to establish the length of their recovery periods. Once that information is available, the Corps will be able adjust the disposal schedule to optimize nesting success in both areas.

It is not clear what effect beach nourishment has on the quality of turtle nesting habitat (Crain et al. 1995). For example, the deposition of sand may change the beach's sand color thereby affecting sand temperature. Because sea turtles exhibit temperature-dependent sex determination, beach nourishment could alter sex ratios of nests deposited in nourished areas. Beach nourishment may influence other physical characteristics of beaches such as sand-grain size and shape, silt-clay content, sand compaction, moisture content, porosity/water retention and gas diffusion rates. The altering of one or more of these physical characteristics may not necessarily impact beach selection by nesting females (Crain et al. 1995) but may reduce reproductive success of nests laid in nourished areas (Ackerman 1996). Moreover, such alterations may affect the fitness and survivability of emergent hatchlings (Foley 1998). There is little to no information available on the effects of beach nourishment on the quality of nesting habitat in North Carolina. As such, the Corps should consider revising their current sea turtle nesting monitoring protocol to include the collection of additional data that would help to address some of the potential impacts listed above. The North Carolina Wildlife Resources Commission is willing to assist with the development of a new monitoring protocol.

#### *Hopper Dredging Impacts on Sea Turtles*

North Carolina's inshore and nearshore waters provide important developmental habitat for immature loggerheads, greens, and Kemp's ridleys virtually year round (Epperly et al. (1995). Leatherbacks are known to occur in our nearshore waters primarily in May and June as they migrate north along the Atlantic Coast. Leatherbacks have also been sighted intermittently in Cape Lookout Bight and less frequently in Core and Pamlico Sounds. Hawksbills (*Eretmochelys*

*imbricata*) are very rare in North Carolina with only three confirmed sightings on record, one of which was found in the Cape Fear River (Sheryan Epperly, NMFS, personal communication). Stranding data collected in Brunswick County by the North Carolina Sea Turtle Stranding and Salvage Network suggest that the period of highest turtle abundance in the project area extends from May – September. However, inlets such as the one located at the mouth of the Cape Fear River may have increased sea turtle abundance during migration periods because they serve as travel corridors for the immigration of turtles into warming inshore waters in the Spring (April – June) and subsequent emigration out of cooling inshore waters in the Fall (October – December).

Hopper dredges are known to take sea turtles in state waters. Unfortunately, the EA does not provide any of the incidental take data collected in North Carolina. Furthermore, it does not include any of the incidental capture data the Corps collected during its 1997 debris removal project in the Wilmington Harbor whereby TED-less shrimp trawlers were deployed to collect debris that accumulated in the harbor following Hurricanes Bertha and Fran. The inclusion of these data would have offered good information on the extent of hopper dredge-related mortality in North Carolina as well as provide additional information on sea turtle abundance within the project area. Statewide stranding data show that the majority of Kemp's ridleys and green turtles that occur in state waters are juveniles with a mean straight carapace length of 33.5 cm ( $SD \pm 8.9$  cm) and 30.3 cm ( $SD \pm 8.0$  cm), respectively. There is a concern that onboard observers will not be able to detect the presence of parts from small turtles that succumb to hopper dredging activities. Therefore, we ask the Corps to provide size class information on past Kemp's ridley and green turtle takes as well as provide any additional assurances that small turtle takes will not go undetected by onboard observers.

#### *Turtle Impacts From A Relocated Ocean Channel*

In addition to the two issues discussed above, there is one more that may have long-term impacts on sea turtles; the moving of the ocean bar channel closer to the Wilmington Offshore Fisheries Enhancement Structure (WOFES). The EA states that there may be a rise in turtle takes during the construction and maintenance of the new channel because of its increased proximity to WOFES, which supports a reef-like community that may attract turtles. If turtles do congregate in the vicinity of WOFES, they may also stand a greater chance of getting struck by propellers from large ships utilizing the channel. It is not uncommon for turtles that have been cut in half to strand on beaches adjacent to major shipping channels. The cause of these strandings has often been attributed to ship propeller strikes (Wendy Teas, NMFS, personal communication). The EA does not acknowledge this potential long-term impact on sea turtles.

A final concern is the potential for the new channel alignment to accelerate beach erosion along southwestern Bald Head Island, resulting in a loss of sea turtle nesting habitat in this area. The wave transformation analysis described on p. 27 of the EA predicts no difference in sediment transport potential associated with the new alignment, but we question whether this accounts for increased tidal (water) velocity closer to this beach.

It should be obvious that we have a number of concerns with the EA. We recommend that these concerns be fully addressed in the next environmental document, be it a revised EA or Environmental Impact Statement. Thank you for the opportunity to comment. If you have questions, please call David Allen (252 448-1546), Ruth Boettcher (252 729-1359), or Bennett Wynne at (252) 522-9736.

Cc: David Allen, NCWRC  
Ruth Boettcher, NCWRC  
Howard Hall, USFWS  
Ron Sechler, NMFS  
Fritz Rohde, NCDMF  
Frank Yelverton, USACOE

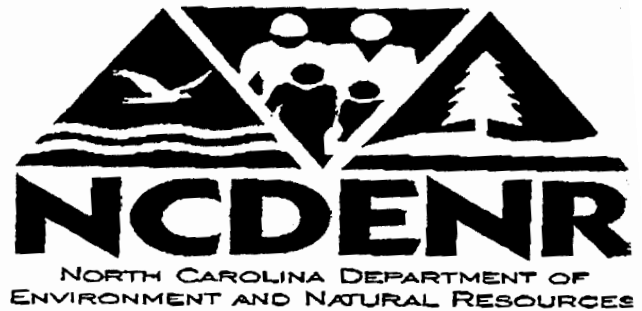
### Literature Cited

- Ackerman, R.A. 1996. The nest environment and the embryonic development of sea turtles. Pp. 83-106 in *The Biology of Sea Turtles* (Lutz, P.L. and J.A. Musick, eds.). Boca Raton, FL, CRC Press.
- Bagley, D.T., R. Owen, S. Johnson, L. Ehrhardt. 1994. Marine turtle nesting at Patrick Air Force Base, Florida; 1987 – 1993: Trends and Issues. Pp. 180 – 181, In “proceedings of the 14<sup>th</sup> Annual Symposium on Sea Turtle Biology and Conservation. Technical Memorandum NMFS-SEFC 351. National Oceanic and Atmospheric Administration, Washington DC.
- Crain, D.A., A.B. Bolten, and K.A. Bjorndal. 1995. Effects of beach nourishment on sea turtles: Review and research initiatives. *Restoration Ecology* 3(2):95-104.
- Ehrhardt, L.M. 1995. The relationship between marine turtle nesting and reproductive success and the beach renourishment project at Sabastian Inlet, Florida, in 1994. Technical report to the Florida Institute of Technology.
- Epperly, S.P., J. Braun, and A. Vieshlow. 1995. Sea turtles in North Carolina waters. *Conservation Biology* 9:385-394.
- Foley, A.M. 1998. The nesting ecology of loggerhead turtles (*Caretta caretta*) in the Ten Thousand Islands, Florida. Ph.D. dissertation, University of South Florida, Tampa, FL. 164 Pp.
- Limpus, C.J., V. Baker, and J.D. Miller. 1979. Movement induced mortality of loggerhead eggs. *Herpetologica* 35(4):335-338.
- Lund, F. 1986. Impacts of beach renourishment programs upon marine turtle nesting at Jupiter Island, Florida, 1969 - 1983. Report to the town of Jupiter Island. Hobe Sound, FL. Pp. 1 – 9.

- Magron J.R. and R.W. Parkinson. *Submitted for publication*. Potential effect of long-term upland sand deposition on Florida high-density nesting beaches. *In* Proceeding of the 20<sup>th</sup> Annual Symposium on Sea Turtle Conservation and Biology, Orlando, FL.
- Palmer, W.M. and A.L. Braswell. 1995. Reptiles of North Carolina. Chapel Hill, NC, The University of North Carolina Press.
- Ryder, C.E. 1993. The effects of beach renourishment on sea turtle nesting and hatching success at Sabastian Inlet State Recreation Area East-Central, Florida. MS thesis, Virginia Polytechnic Institute and State University, Blacksberg, VA. Pp. 1 – 109.
- Schroeder, B.A. 1994. Florida index nesting beach surveys: are we on the right track? Pp. 132-133 *in* Proceedings of the 14<sup>th</sup> Annual Symposium on Sea Turtle Biology and Conservation (Bjorndal, K.A., A.B. Bolten, D.A. Johnson, and P.J. Eliazar, compilers). NOAA Technical Memorandum NMFS-SEFSC-351.
- Steinitz, M.J. 1996. The effects of beach renourishment on the nesting behavior and hatching success of the loggerhead sea turtle on Jupiter Island, Florida: a seven year study. MS thesis, Florida Atlantic University, Boca Raton, Florida. Pp. 1 – 88.
- Turtle Expert Working Group. 1998. An assessment of the Kemp's ridley (*Lepidochelys kempii*) and loggerhead (*Caretta caretta*) sea turtle populations in the western North Atlantic. NOAA Technical Memorandum NMFS-SEFSC-409. 96 Pp.
- Witherington, B.E. and R.E. Martin. 1996. Understanding, assessing, and, resolving light-pollution problems on sea turtle nesting beaches. Florida Marine Research Institute Technical Report TR-2. 73 Pp.

State of North Carolina  
Department of Environment  
and Natural Resources  
Wilmington Regional Office  
Division of Marine Fisheries

James B. Hunt, Jr., Governor  
Bill Holman, Secretary  
Preston Pate, Director



MEMORANDUM

March 30, 2000

TO: Melba McGee

FROM: Fritz Rohde *FR*

SUBJECT: Wilmington Harbor Environmental Assessment

The North Carolina Division of Marine Fisheries has concerns and/or objections to various parts of this document. Seasonal dredging windows in the Cape Fear River were modified several years ago to allow dredging from August 1 through January 31. This shift was done to protect migrating anadromous fishes from disturbances as well as provide more protection to larval and juvenile organisms. This restriction was for the entire Cape River estuary not just from Lower Swash Channel (about river mile 3) upstream as stated on page 10. In the Division's opinion, the Cape Fear estuary begins behind a line drawn from the southwestern corner of Bald Head Island to the southeastern corner of Oak Island. This would include Smith Island Channel in the estuary and to the seasonal restrictions. The Division is mandated by the Atlantic States Marine Fisheries Commission to recover American shad stocks. This species migrates up the Cape Fear River primarily from February through April. Studies have demonstrated that hydraulic dredging activities disrupt this upstream movement. Thus, Smith Island Channel should fall within the seasonal restriction. Additionally, the Division opposes any relaxation of the seasonal windows during construction as proposed in the document (page 11). These windows were decided upon after considerable discussion and while effective, do not fully protect marine organisms.

The impacts of blasting need to be further studied. Immediately after a blast, a survey should be done of the impact area to determine quantity and identity of fishes killed (prior to their being consumed by fishes). The channel net downstream may collect some of the dead organisms but during the blasting tests, few of the dead fishes released off the blasting barge were recovered by that gear. Data should be shared with the agencies and if the losses become too severe in the agencies' opinion, then other measures should be taken to reduce loss.

Studies proposed to assess impacts on the benthos and Primary Nursery Areas are adequate.

# Brunswick Beaches Consortium

An Interlocal Undertaking of Brunswick County and  
these Municipalities: Bald Head Island, Caswell Beach,  
Holden Beach, Oak Island, Ocean Isle Beach & Sunset Beach

**Harry Simmons**  
Chairman

707 Caswell Beach Road  
Caswell Beach NC 28465  
Telephone 910-278-4625  
Facsimile 910-278-7982

HarrySimmons@HarrySimmons.com

March 29, 2000

Mr. John Meshaw, CESAW-TS-PE  
U. S. Army Engineer District  
Post Office Box 1890  
Wilmington, North Carolina 28402-1890

Re: Environmental Assessment (EA), Wilmington Harbor, North Carolina

Dear Mr. Meshaw:

The Brunswick Beaches Consortium is the lead group representing Brunswick County and all the Brunswick County beach municipalities in matters pertaining to regional beach preservation and sand management. We strongly and vigorously support the placement of all beach-quality sand derived from the dredging of the Wilmington Harbor Channel onto the qualifying adjacent beaches of Brunswick County without delay. The positive benefits to our beaches overwhelmingly support this action.

We support, and will cooperate with, any and all reasonable efforts to resolve any challenges pertaining to threatened and endangered species habitats and other such issues that would allow the sand placement portion of the project to proceed at its most rapid pace to completion.

Thank you for the opportunity to comment.

Sincerely,

A handwritten signature in black ink, appearing to be 'H. Simmons', written over a horizontal line.

Harry Simmons  
Chairman, Brunswick Beaches Consortium



**William A. Caster**  
Chairman

**Robert G. Greer**  
Vice-Chairman

**Buzz Birzenieks**  
Commissioner

**Ted Davis, Jr.**  
Commissioner

**Charles R. Howell**  
Commissioner

Office of  
**Board of Commissioners**

**New Hanover County**  
320 Chestnut Street, Room 305  
Wilmington, North Carolina 28401-4093  
Telephone (910) 341-7149  
Fax (910) 341-4130

March 10, 2000



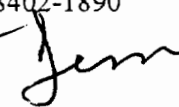
**Wanda M. Copley**  
County Attorney

**Allen O'Neal**  
County Manager

**Lucile F. Harrell**  
Clerk to the Board

Action: PM  
CF: DE DX  
DP TS  
RG

Col. James W. DeLony  
District Engineer  
U.S. Army Corps of Engineers  
Wilmington District  
PO Box 1890  
Wilmington, NC 28402-1890

Dear Col. DeLony: 

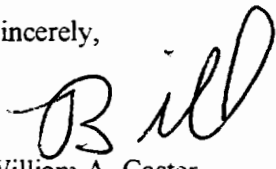
I am writing in support of the Wilmington Harbor Project and the Corp's Finding of No Significant Impact for the draft Environmental Assessment. The Board of County Commissioners believes that this project will yield substantial benefits, environmental as well as economic, for all citizens of North Carolina.

The Wilmington Harbor Project will increase the navigation channel on the Cape Fear River from 38 to 42 feet and will realign the ocean bar entrance to the river. This modification in the project will avoid the need for rock blasting and avoid negative impact on live coral on the existing site. The ocean bar entrance will lower the total project cost by millions of dollars and will ensure the project remains on schedule.

The Port of Wilmington serves as a gateway to global markets for North Carolina business, industry and consumers. The widening of the channel will allow the Port to keep current customers and to remain competitive in attracting new business. Expanded activities at the Port will mean more jobs and tax revenues for citizens across the state.

On behalf of the New Hanover County Board of Commissioners, I encourage your Finding of No Significant Impact for the draft Environmental Assessment so the project can move forward as quickly as possible.

Sincerely,

  
William A. Caster  
Chairman

WAC:mlp

Action: PM  
CF: DE DE  
DP TS  
RG



North Carolina General Assembly  
House of Representatives  
Daniel F. McComas  
13th District

OFFICE ADDRESS: 606 LEGISLATIVE OFFICE BUILDING  
RALEIGH, NC 27601-1096  
TELEPHONE: (919) 733-5786  
(919) 733-5815 FAX  
E-MAIL: dannyf@ms.ncga.state.nc.us

DISTRICT ADDRESS: PO Box 2274  
WILMINGTON, NC 28402  
(910) 343-8372

March 13, 2000

Mr. James W. DeLony  
Colonel, U.S. Army, District Engineer  
Department of the Army  
Wilmington District, Corps of Engineers  
P.O. Box 1890  
Wilmington, NC 28402-1890

Re: *Wilmington Harbor Project*

Dear Mr. DeLony:

It is my pleasure to give my endorsement on the Wilmington Harbor Project, as I believe it will provide substantial benefits, environmental as well as economic, for all citizens of North Carolina.

The Wilmington Harbor Project is truly a win-win situation for all North Carolina citizens for environmental and economic benefits, with taking the navigation channel on Cape Fear River from 38 to 42 feet.

The realignment of the Ocean Bar Entrance provides many environmental positives by avoiding large concentration of rock, and live coral bottom at the existing site. This entrance also frees up the existing site for backfill and non-beach quality materials from deepening and maintenance of the inner harbor reaches. It will reestablish fishing and shrimping grounds for reclamation by local commercial fishermen and shrimpers, not to mention this will lower the total project cost by millions of dollars and keep the project on the proposed time table.

We need to protect North Carolinas Beaches from potential damage of hurricanes and erosion. Sand from the Deepening Project will be used for this purpose.

Ports in Georgetown, Charleston, and Savannah will also be dredged. It is important for Wilmington to remain competitive, and with the new 42-foot navigation channel, we should be able to accomplish this task.

Global economy has brought about larger ships, with which Wilmington must have the capability to serve these ships.

Should you wish to discuss this further with me, please feel free to call at (910) 343-8372.

Sincerely,

Daniel F. McComas

A large, stylized handwritten signature of Daniel F. McComas, written in dark ink, overlapping the printed name.





## **TOWN of CASWELL BEACH**

P.O. Box 460 • Caswell Beach, NC 28465 • (910) 278-5471 • Fax: (910) 278-5490

March 29, 2000

Mr. John Meshaw, CESAW-TS-PE  
U. S. Army Engineer District  
Post Office Box 1890  
Wilmington, North Carolina 28402-1890

Re: "Modifications" Environmental Assessment (EA), Wilmington Harbor, NC

Dear Mr. Meshaw:

Our town would be a primary beneficiary of the disposal of beach-quality sand from this project and, as such, we wholeheartedly support the project and do not wish to see it delayed in any way.

That said, we still have a few typographical errors to point out and a couple of comments:

On page 6, the table pertaining to Section 933 disposal, the next to last row should read only "West Oak Island".

In Appendix A, Page 4, Table 1, the last row above "Totals" should read "East Oak Island - Caswell Beach"

In Appendix A, Page 6, Table 2, the next to last row should read only "West Oak Island".

(Generally speaking, wherever the words "West Oak Island" are used in the EA, the words "Caswell Beach" should not also be associated. In places where the words "East Oak Island" are used, the words "Caswell Beach" should usually be associated.)

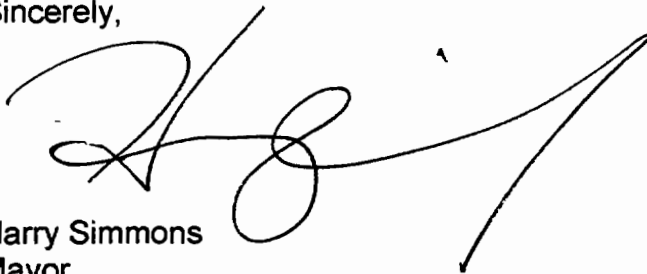
We request regular Corps monitoring of subsequent ocean shoreline erosion rates to determine whether the new alignment of the Channel has a positive or negative impact on the ocean shoreline of Caswell Beach. We request that all findings from such monitoring be shared with the Town of Caswell Beach prior to any disposal of future maintenance dredging spoils and that adjustments be made in such disposals to overcome any negative impacts on Caswell Beach.

We encourage year-round dredging and disposal of beach-quality sand during this project, with proper monitoring for endangered species, so as to avoid unnecessary demobilization and remobilization of dredging plants and minimize the resulting disruptions to the human environment of Caswell Beach: its residents, property owners and their guests.

The Town of Caswell Beach expects this project to have only positive impacts on the long-term usefulness of our beach as a sea turtle habitat, and will work with our existing authorized and recognized sea turtle monitoring team to maximize those positive impacts.

Thank you for the opportunity to comment on this project .

Sincerely,

A handwritten signature in black ink, appearing to read 'H. Simmons', with a long, sweeping horizontal stroke extending to the right.

Harry Simmons  
Mayor

cc: Wayne Bissette, Project Manager, CESAW  
Caswell Beach Commissioners Boyd, O'Connor, Spake, Vest & Zalewski



Action: TS  
CF: DE DX  
DP PM  
PAO

March 23, 2000

Colonel James W. DeLony  
District Engineer  
Wilmington District, US Army Corps of Engineers  
P.O. Box 1890  
Wilmington, NC 28402-1890

Dear Colonel DeLony:

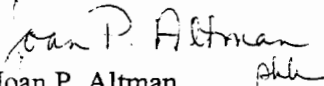
Thank you for the opportunity to comment on the Environmental Assessment Preconstruction Modification of Authorized Improvements, Wilmington Harbor, North Carolina, February 2000.

The Town of Oak Island concurs with the conclusion that the proposed Federal action will not significantly affect the quality of the human environment and an Environmental Impact Statement should not be required.

In addition, the Town of Oak Island agrees to work with the US Army Corps of Engineers as necessary to provide monitoring activities associated with placing dredged material on the beach. The Town endorses action to place dredged material on the beach in a continuous project which would require activity on the Oak Island beach during sea turtle nesting season. The Town understands the importance of maintaining proper, accountable sea turtle monitoring activities during this time and will take necessary actions determined by the US Army Corps of Engineers.

The Town of Oak Island Town Council and I commend the US Army Corps of Engineers, Wilmington District staff on their diligence and professionalism. We look forward to working with you and your staff as this project moves to completion.

Sincerely,

  
Joan P. Altman  
Mayor

# National Audubon Society



North Carolina State Office &  
North Carolina Coastal Islands Sanctuary  
720 Market Street  
Wilmington, NC 28401-4647  
(910) 251-0666  
(910) 762-9486 Fax

March 16, 2000

## CHAPTERS

Cape Fear

Elisha Mitchell

Forsyth

Gaston

Highlands

Mecklenburg

New Hope

T. Gilbert Pearson

Wake

Wayne

Colonel James W. DeLony  
District Engineer  
US Army Corps of Engineers  
P.O. Box 1890  
Wilmington, NC 28402-1890

Re: Environmental Assessment, Preconstruction Modifications of Authorized Improvements, Wilmington Harbor, North Carolina, February 2000.

Dear Colonel DeLony,

Thank you for the opportunity to comment on Environmental Assessment, Preconstruction Modifications of Authorized Improvements, Wilmington Harbor, North Carolina, February 2000. We have reviewed the modifications proposed and wish to submit the following comments.

The lower Cape Fear River basin, associated disposal islands, tidal sand flats and beaches of New Hanover and Brunswick Counties have long support a great diversity of birds, sea turtles, and other wildlife. It is our opinion that the modifications as proposed may have a negative impact on nesting seabirds and migratory shorebirds, and potentially sea turtles and inshore fisheries. We address the impact on birds in this letter.

It is well known and understood that seabirds, such as terns, pelicans and gulls, utilize open bare sand and sparsely-vegetated habitats on disposal islands in the Cape Fear River for breeding. In 1999, the disposal islands commonly referred to as "Ferry Slip Island" and "South Pelican Island" supported 27% of North Carolina's Brown Pelicans (1,172 nests), 25% of North Carolina's Royal Terns (3,070 nests), 27% of North Carolina's Sandwich Terns (653 nests), 16% of North Carolina's Gull-billed Terns (24 nests), and 17% of North Carolina's Laughing Gulls (3,100 nests). These islands have been recognized by the American Bird Conservancy and the National Audubon Society as "globally important" for royal and sandwich terns and "continentally important" for brown pelicans.

These islands were created by the disposal of dredged sand. The habitats on these islands and the islands themselves have been maintained for more than two decades by the periodic renourishment with sand dredged from the adjacent river channel. These islands are essential to maintaining populations of seabirds at their present levels as described by Parnell and Shields (1990) in Management of North Carolina's Colonial Waterbirds (UNC-Sea Grant Publication).

Periodic renourishment of both Ferry Slip and South Pelican Islands, at intervals of approximately seven years, is essential to maintaining these seabird nesting sites and North Carolina's current population of seabirds. These islands should not be considered as candidates for "island recycle sites." Rather, they should be maintained at their present size and shape to allow for the continued usage by

nesting colonial seabirds. These islands should remain totally off-limits to equipment and personnel from March 15<sup>th</sup> to September 15<sup>th</sup>. The plan for the disposal of dredged sand from the lower reaches of the Cape Fear River should include the maintenance of both Ferry Slip and South Pelican Islands at their current size and shape. Renourishment of these islands should be coordinated with the NC Wildlife Resources Commission and the NC Colonial Waterbird Management Committee.

The beaches of Brunswick County, especially those areas around the mouth of the Cape Fear River and Cape Fear point have been used as nesting sites by least terns, black skimmers, American oystercatchers, and Wilson's plovers. Federally-listed piping plovers have been recorded nesting (adjacent to Shallote Inlet) and wintering on Holden Beach. Little is known about piping plover occurrence on the beaches of Bald Head Island. Disposal of sand on beaches from a period of April 1 to August 31 will jeopardize survivorship of beach-nesting birds if these species have established nesting sites or colonies in the project area. Operation of equipment and disposal of sand should not occur in these areas during the nesting season.

Invertebrates that inhabit the intertidal zone of Brunswick County beaches provide vital food for at least 12 species of shorebirds. Beach disposal of dredged sand disrupts community structure and eliminates intertidal invertebrates, thus eliminating food supply for shorebirds. Although community structure and populations of intertidal organisms may recover given enough time, the maintenance interval stated, "beach placement of about 1.1 million cubic yards of sand every 2 years," does not allow sufficient time for recovery of intertidal invertebrate communities and populations. This will negatively impact shorebirds foraging along beaches in the project area during both spring and fall migrations. Areas with high shorebird usage (primarily those areas not immediately adjacent to beachfront development) should not receive sand from maintenance dredging. Shorebird surveys should be conducted throughout to determine distribution and abundance. Disposal of dredged sand in areas with significant concentrations of shorebirds and areas with federally-listed species should be avoided.

The lower reaches of the Cape Fear River and the beaches of Brunswick County are important to bird populations and species diversity in North Carolina. We urge you to take every precaution necessary to minimize the impact of this project on birds, sea turtles, and fisheries in the region.

Sincerely,



Walker Golder  
Deputy Director

Cc: Chris Canfield, Executive Director, National Audubon Society--NC  
Coleman Long, USACOE, Environmental Resources Section  
Frank Yelverton, USACOE, Environmental Resources Section  
John Meshaw, USACOE, Environmental Resources Section





Action: PM  
CF: DE D  
TS PA

**Burlington Industries, Inc.**

International Traffic  
Box 691  
Burlington, North Carolina  
27216-0691  
(336) 228-2235/2014  
FAX 336-228-2207

**James W. Deloy  
Colonel, U.S. Army  
District Engineer  
Department of the Army  
Wilmington District, Corps of Engineers  
P.O.Box 1890  
Wilmington, NC 28402-1890**

**March 8, 2000**

**Gentlemen:**

**I am writing to support the Wilmington Harbor Project, which I understand will take the navigation channel on the Cape Fear River from 38 to 42 feet.**

**Realignment of the Ocean Bar Entrance will provide Environmental positives by avoiding blasting of rock and the Impact on live coral bottom at existing site.**

**The New Ocean Bar Entrance will also free existing site for back fill with non-beach quality materials from deepening and Maintenance of the inner harbor reaches.**

**The New Ocean Bar Entrance will also lower the total project Cost by millions of dollars and will keep the project on schedule.**

**Sand from Deepening Project can be used to protect area Beaches from hurricanes and erosion, thereby mitigating Potentially millions of dollars in damage as well as preserving North Carolina's coastline for generations to enjoy.**

**The Port of Wilmington serves as a gateway to global markets For North Carolina business community. New 42-foot Navigation channel allows the Port of Wilmington to remain Competitive and help attract new business.**

**H. Spalding Craft**  
P.O. Box 2036  
Morehead City, N.C. 28557  
Home Phone 252-247-0232

Action: PM  
CF: DE D.  
DP R.

March 09, 2000

Col. James W. DeLony  
District Engineer  
Department of the Army  
Wilmington District, Corps of Engineers  
P.O. Box 1890  
Wilmington NC 29402-1890

Dear Col. Delony:

I am a member of the Board of Trustees of the NC State Ports Authority. While I live in Morehead City, I obviously have great interest in both Ports and in the continued development of Wilmington as a competitive container Port.

It is clear that this continued development is not possible without a successful completion of the Wilmington Harbor Project. I'm sure it has been made abundantly clear to you many times the benefits of the Project even outside of the obvious commercial impacts -items such as environmental benefits and the sand contribution to protect area beaches. I will not repeat these benefits here other than to ask you and the Corps to take them into consideration when deciding the issue of No Significant Impact. I really think that the points that have been made many times are compelling and speak for themselves.

The Wilmington District has been extremely supportive of both Ports and we are very grateful for that. Since I live in Morehead City I see every day the positive impact of Harbor dredging and the subsequent renourishing of the local beach. The Port is successful and certainly would not be so without the continual support of the Corps. But now the Wilmington Harbor needs a significant improvement and obviously the Corps is the key to this at this juncture. Your continued support of the North Carolina Ports is earnestly sought and would greatly appreciated.

Thank you for your attention.

Yours sincerely,



cc: Mr. Erik Stromberg



# STAR SHIPPING INC.

200 GALLERIA PARKWAY N.W. SUITE 850. ATLANTA, GA 30339

TEL: 770-226-5900 - FAX: 770-226-5977 - 1-800-666-7869 - TWX 710 474 0004 - W.U. TELEX 643 140 - CABLE STARBAY

March 9, 2000

Head Office:  
Bergen, Norway

Branch Offices:  
Savannah, GA      Rio De Janeiro, Brazil  
Mobile, AL          Tokyo, Japan  
Vancouver, BC      Sydney, NSW  
Portland, OR          Livorno, Italy  
San Francisco, CA    Saint John, N.B.  
Long Beach, CA



Col. James W. DeLony, US Army  
District Engineer  
Dept. Of the Army  
Wilmington District, Corps of Eng.  
P.O. Box 1890  
Wilmington, NC 28402-1890

Re: Finding of No Significant Impact -- Wilmington Harbor Deepening Project

Dear Col. DeLony:

Star Shipping vessels of up to 46,000 tons deadweight call Wilmington on a regular basis. Wilmington is usually either the final or the penultimate loadport for those vessels. We have had many problems caused by the insufficient water depth available and have had to restrict cargo liftings due to this. Star welcomes the deepening to 42 feet. Our H class vessels can be as deep as 39' 6" when fully loaded in saltwater.

We need the extra water, in order to fulfill our commitments to existing customers and to try to increase our bookings. But what is good for Star and other carriers also provides economic benefits for Wilmington and the region--more man-hours for the longshore industry and related vendors.

The Finding of no Significant Impact is a step in the right direction. It means that the project cost will be lowered, completion of the project will be earlier and large areas of natural rock and coral can be left untouched. I understand that sand from the project will be used to protect beaches from erosion and hurricane damage, which has major importance for an area as exposed as North Carolina's coastline.

Therefore, in conclusion I would like to add Star Shipping's support for the project and the Finding of no Significant Impact.

Sincerely,

Capt. Raoul G. Matson  
General Operations Manager

# SOLAR INTERNATIONAL SHIPPING AGENCY, INC.



GENERAL AGENT FOR

## YANG MING LINE

525 WASHINGTON BLVD., 25TH FLOOR, JERSEY CITY, NJ 07310

TEL: (201) 222-8899 • FAX: (201) 222-6699

Action: PM  
CF: DE  
DX  
DP

March 10, 2000

James W. DeLony  
Colonel, U.S. Army  
District Engineer  
Department of the Army  
Wilmington District  
Corps of Engineers  
P.O. Box 1890  
Wilmington, NC 28402-1890

Dear Colonel DeLony:

On behalf of Solar International Shipping Agency, general agent for Yang Ming Line in North-America, I am writing this letter in support of a Finding of No Significant Impact for the draft Environmental Assessment.

Yang Ming Line container vessels have been calling on the port of Wilmington, NC for the past two decades. As such, we believe that the Wilmington Harbor Project will be beneficial to the Port of Wilmington and its customers, since it will deepen the navigation channel on Cape Fear River from 38 to 42 feet. The above will enhance the Port of Wilmington capabilities to serve as a gateway to global markets

Again, as a long-term customer of the port, we are in support of a Finding of No Significant Impact for the draft Environmental Assessment.

Thank you.

Very truly yours,

Robert S. Ho  
President & CEO

# ANDREW KOEPPPEL

P.O. BOX 4443  
WILMINGTON, NC 28406

(910) 790-9444

MARCH 10, 2000

Action: PM  
CF: OC  
DP

COLONEL JAMES W. DE LONY  
DISTRICT ENGINEER  
DEPARTMENT OF THE ARMY  
WILMINGTON DISTRICT, CORPS OF ENGINEERS  
P.O. BOX 1890  
WILMINGTON, NC 28402

RE: HARBOR DEEPENING

DEAR COLONEL,

IT HAS COME TO MY ATTENTION THAT YOU ARE PREPARED TO RECEIVE COMMENTS RELATIVE TO THE DRAFT ENVIRONMENTAL ASSESSMENT RELEASED BY THE CORPS OF ENGINEERS. IT IS MY UNDERSTANDING THAT THIS DRAFT INDICATES A FINDING OF NO SIGNIFICANT IMPACT.

SINCE IT IS CRITICALLY IMPORTANT FOR THE PROJECT TO BE COMPLETED AT THE EARLIEST POSSIBLE TIME DUE TO THE ENORMOUS ECONOMIC BENEFITS THAT WILL ACCRUE IN THE FORM OF MORE JOBS AND GREATER TAX REVENUES, I STRONGLY URGE YOU TO PROCEED WITH THE PROJECT AS SCHEDULED. IT IS INTERESTING TO NOTE THAT THERE ARE SEVERAL MAJOR ADVANTAGES TO REALIGNING THE ENTRANCE CHANNEL ACROSS THE OCEAN BAR.

1. BY ELIMINATING THE NEED FOR ROCK BLASTING, THERE WILL BE NO POTENTIAL NEGATIVE ENVIRONMENTAL IMPACT ON THE LIVE CORAL BOTTOM IN THE AREA.
2. THE EXISTING BACK FILL SITE CAN BE USED TO RECRUIT BENTHIC LIFE FORMS RESULTING IN NEW FISHING AND SHRIMPING GROUNDS THAT CAN BE UTILIZED FOR COMMERCIAL PURPOSES. THIS WILL CREATE ADDITIONAL JOBS.
3. SAND FROM THE PROJECT CAN BE USED TO RENOURISH BEACHES THAT HAVE BEEN DEPLETED BY ADVERSE WEATHER CONDITIONS.

IT SHOULD BE ADDED THAT IN CONJUNCTION WITH THIS DREDGING PROJECT I AM PERSONALLY ENGAGED IN CONVERSATIONS WITH THE STATE DEPARTMENT OF TRANSPORTATION RELATIVE TO IMPROVED

HIGHWAY AND RAIL CONNECTIONS BETWEEN WILMINGTON AND THE REST OF THE STATE. IT IS HOPEED THAT WITHIN THE TIME FRAME THAT THIS PROJECT IS COMPLETED WE WILL HAVE AN INTERSTATE QUALITY HIGHWAY BETWEEN WILMINGTON AND CHARLOTTE AS WELL AS UPDATED RAIL CONNECTIONS THAT CAN BE UTILIZED FOR CONTAINER SHIPMENTS.

IF THIS OCCURS, THE INCREASES IN FREIGHT TONNAGE AS A RESULT OF THIS DEEPENING PROJECT WILL EXCEED EVERYONE'S EXPECTATIONS. PLEASE PROCEED WITH THE DREDGING AS SOON AS POSSIBLE TO ENABLE THE PORT OF WILMINGTON TO BECOME THE PREFERRED OCEAN FREIGHT DESTINATION FOR BUSINESS NOT ONLY WITHIN OUR STATE BUT ALSO THROUGHOUT THE WORLD.

VERY TRULY YOURS,

  
ANDREW KOEPPEL

March 13, 2000

James W. DeLony  
Colonel, U.S. Army  
District Engineer  
Department of the Army  
Wilmington District, Corps of Engineers  
P. O. Box 1890  
Wilmington, NC 28402-1890

Action: PM  
CF: DE DX  
DP RG  
TS

Re: Environmental Assessment for Wilmington Harbor Deepening Project

Dear Mr. DeLony:

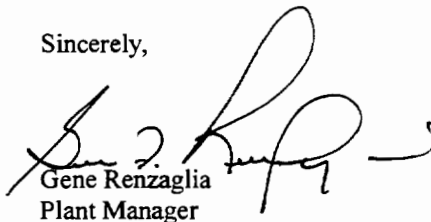
I am writing this letter in support of the U.S. Army Corps of Engineers' Finding of No Significant Impact regarding the draft Environmental Assessment for the Wilmington Harbor Deepening Project. The preconstruction modifications will realign the entrance channel across the ocean bar and reduce explosive blasting requirements. These modifications will yield significant environmental benefits, save over \$40 million dollars in costs, and accelerate the project's completion date.

The project modifications will provide substantial environmental benefits. The realignment of the Ocean Bar Entrance will eliminate the need for blasting over 2 million cubic yards of rock and minimize impacts to the live coral bottom at the existing site. The new Ocean Bar Entrance will free up the existing site for backfill with non-beach quality materials from deepening and maintenance of the inner harbor reaches and allow for recruitment of benthic life forms. In addition, sand from the project will be used to protect area beaches from hurricanes and erosion.

As plant manager of a chemical manufacturing plant in North Carolina, I recognize that the current depth of the Wilmington Harbor severely limits its use of cost-effective ships. The project will address critical needs for deeper and wider channels to accommodate the draft requirements of fully loaded cargo vessels and meet requirements for larger ships in the long term. Deepening the Harbor will hold down land transportation costs and lower port service charges, therefore allowing the Wilmington Port to be successful in attracting new business and more effectively engage in world trade.

In summary, I strongly support the Corps' Finding of No Significant Impact concerning the draft Environmental Assessment for the Wilmington Harbor Deepening Project. The project is a win-win situation for North Carolina business, industry, and citizens that will provide both environmental and economic benefits. The project modifications will minimize environmental impacts, lower project costs by millions of dollars, and advance the project's timetable. Completion of the deepening project is a major infrastructure need that will allow the Wilmington Port to expand globally and become more competitive with other ports on the eastern seaboard. This project is vital to the state's economy and growth and will mean more jobs and tax revenue for North Carolina in the future.

Sincerely,

  
Gene Renzaglia  
Plant Manager



**Occidental Chemical Corporation**

5408 Holly Shelter Road, P.O. Box 368, Castle Hayne, North Carolina 28429  
910/675-7200 FAX: 910/675-7201

Carolina Star Site







3100 SMOKETREE COURT • SUITE 801 • RALEIGH, NC 27604

TELEPHONE (919) 790-8244 • FAX (919) 790-8266

March 14, 2000

Action: PM  
CF: DE DX  
DP TS  
RG

James DeLony, Colonel, U.S. Army  
District Engineer, Department of the Army  
Wilmington District Corp of Engineers  
P.O. Box 1890  
Wilmington, NC 28402-1890

Dear Colonel Delony;

Morehead City Terminals, Inc. supports the draft *Wilmington Harbor Project Environmental Assessment* on the deepening of the Cape Fear River. Morehead City Terminals operates a bulk handling facility and a short line railroad at the Port of Morehead City. Our company handles about 1 million tons of wood chips annually along with other bulk commodity products serving multiple global customers and clearly understands the need for deeper drafts at our Ports. The proposed deepening project would benefit our business, industry, and consumers across North Carolina.

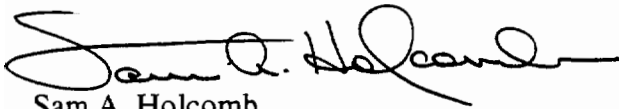
Based upon the project's environmental assessment, this project ensures numerous positive effects on the ocean bar entrance. These include:

1. Re-establishing fishing and shrimping grounds for reclamation by local commercial fishermen and shrimpers,
2. The existing live coral bottom would avoid impact,
3. Sand from the deepening project would be used to protect area beaches from normal erosion and erosion due to hurricanes,
4. The need to blast 2 million cubic yards of rock has been eliminated.

The proposed modifications to realign the entrance channel across the ocean bar would save over \$40 million in project costs. These modifications are expected to take months, possibly years off the project's duration. A new 42-foot navigation channel would allow the Port of Wilmington to keep current customers and to be competitive in attracting new business. Subsequently, this means more jobs and more tax revenues for the citizens of North Carolina.

Again, Morehead City Terminals, Inc. fully supports the proposed deepening of the navigation channel. We hope that the Harbor Project can proceed on schedule under the existing plans.

Sincerely,

A handwritten signature in black ink, appearing to read "Sam A. Holcomb", with a stylized flourish at the end.

Sam A. Holcomb  
President, Morehead City Terminals & Carolina Rail Service



## HANJIN SHIPPING COMPANY, LTD.

MARITIME TRADE CENTER, 2128 BURNETT BLVD., WILMINGTON, NC 28401 • TEL: (910) 343-1464 • FAX: (910) 251-1189

March 15, 2000

James W. DeLony  
Colonel, U.S. Army  
District Engineer  
Department of the Army  
Wilmington District, Corps of Engineers  
P.O. Box 1890  
Wilmington, NC 28402-1890

Dear Colonel DeLony,

I am writing this letter today on behalf of Hanjin Shipping Company, LTD in support of Finding of No Significant Impact for the draft Environmental Assessment.

The Wilmington Harbor Project takes navigation channel on Cape Fear River from 38 to 42 feet, and is a win-win situation for all North Carolina citizens for environmental and economic benefits.

Hanjin Shipping Co. Ltd is a Seoul, Korea based conglomerate. Our vessels call the port on a weekly basis sharing with Yang Ming lines. The particular vessels we utilize on this service are the smallest sized that we use in the North America market place. However, we are barely able to navigate the Cape Fear River due to drafting problems unless we call at high tide.

Our vessels are where today's large global carriers are focused. The dredging and completion of the Cape Fear River is essential if the State of North Carolina is seeking to be a regular "player" in containerized shipping environment for today and the future.

Please take our message very seriously in evaluating and completing this task. Should you have any questions, please call me at 910-251-9377.

Sincerely,

Chuck Kuebler  
Sales Assistant Manager



www.nccbi.org

# North Carolina Citizens for Business & Industry

P.O. Box 2508, Raleigh, NC 27602 • 225 Hillsborough Street, Suite 460, Raleigh, NC 27603 • Telephone: (919) 836-1400 • Fax: (919) 836-1425

March 17, 2000

## Executive Committee:

- John V. Andrews  
Monroe
- William Cavanaugh III  
Raleigh
- Sue W. Cole  
Greensboro
- William A. Coley  
Charlotte
- John A. Forlines Jr.  
Granite Falls
- James B. Hyler Jr.  
Raleigh
- Kelly S. King  
Winston-Salem
- George W. Little  
Southern Pines
- Robert R. Mauldin  
Rocky Mount
- Henry E. Miller Jr.  
Wilmington
- Stephen P. Miller  
Asheville
- Pope Shuford  
Hickory
- Will B. Spence Jr.  
Charlotte
- Dr. Patricia Sullivan  
Greensboro
- C. Avery Thomas  
Burlington
- N. Bradley Thompson Jr.  
Badin Lake
- Dr. Julianne Still Thrift  
Winston-Salem
- Edward L. Weisiger Jr.  
Charlotte
- Paul M. Wiles  
Winston-Salem
- Stephen K. Zaytoun  
Cary

## Chairmen Emeritus:

- L. M. Baker Jr.  
Winston-Salem
- Edwin B. Borden  
Goldsboro
- Thomas W. Bradshaw Jr.  
Raleigh
- Richard L. Daugherty  
Raleigh
- R. Stuart Dickson  
Charlotte
- Donald R. Hughes  
Greensboro
- John F. McNair III  
Winston-Salem
- John O. McNairy  
Kinston
- Sherwood H. Smith Jr.  
Raleigh
- G. Smedes York  
Raleigh
- Charles E. Zeigler Jr.  
Gastonia
- Stephen P. Zeinak Jr.  
Raleigh

Mr. James W. DeLony  
Colonel, U.S. Army  
District Engineer  
Department of the Army  
Wilmington District, Corp. of Engineers  
P.O. Box 1890  
Wilmington, NC 28402-1890

Dear Mr. DeLony:

On behalf of the 2000 members of North Carolina Citizens for Business and Industry, the state chamber of commerce, I am writing to encourage you to approve the Finding of No Significant Impact for pre-construction modifications for the Wilmington Harbor project. This will allow for the deepening of the Cape Fear River navigation channel from 38 feet to 42 feet.

Approval of this Finding will result in a win-win proposition for all concerned. The modifications will be hopefully from both an economical and an environmental basis. There will not be a need to blast over two million cubic yards of rock, and this will save over \$40 million in project costs. This will also save a considerable amount of time.

From an environmental standpoint, the sand from the deepening project will be used to protect area beaches from hurricanes and erosion. This will be of crucial help for our state's number two industry - travel and tourism. It will also enable the Port of Wilmington to keep its current customers and to be competitive for attracting new business. This translates into more jobs and additional tax revenues!

Thank you for your consideration of these very important issues.

Sincerely,

*Phillip J. Kirk, Jr.*

Phillip J. Kirk, Jr.  
President

PJKjr\k1

Earl N. Phillips Jr., High Point, *Chairman of the Board* • Malcolm E. Everett III, Charlotte, *First Vice Chairman*  
Gordon S. Myers, Asheville, *Second Vice Chairman* • R. Horace Johnson, Raleigh, *Treasurer* • Phillip J. Kirk Jr., Raleigh, *President/Secretary*

**Frank S. Conlon**  
**1831 Hawthorne Rd.**  
**Wilmington, NC 28403-6615**  
**Phone & Fax: 910-343-8089**

20 March 2000

**To:** COL James W. DeLony, District Engineer

**Fax Number** 251-4185

**SubJ:** Draft Environmental Assessment Finding

**Ref:**

**Number of pages including this page** 1

-----

In my role of private citizen who is interested in maritime affairs and the economic progress of Wilmington and the state, I strongly support the Corps Finding of No Significant Impact on the environment attributable to the forthcoming dredging of the Cape Fear River channel.

Reducing the cost of the project by avoiding a great deal of rock, reducing the transit time for ships, enhancing the competitive posture of our port, using the removed sand to protect the jeopardized beaches of Brunswick County are factors which marshal support for undertaking the project as proposed and bringing it to completion as quickly as possible.

In sum, I fully support your Finding of No Significant Impact.

Sincerely,



Frank Conlon  
CAPT USN (Ret)



THE UNIVERSITY OF NORTH CAROLINA AT WILMINGTON

Colonel James W. DeLony  
U.S. Army, District Engineer  
Wilmington District, Corps of Engineers  
P.O.Box 1890  
Wilmington, NC 28402-1890

March 20, 2000

Dear Colonel DeLony,

I am writing in response to Public Notice and Notice of Availability CESA-W-TS-PE-00-65-0003, the Environmental Assessment for Preconstruction Modification of Authorized Improvements for Wilmington Harbor, North Carolina, dated February 24, 2000.

I am a biologist who studies bottlenose dolphins here in the Wilmington area, and I was recently contracted to do baseline surveys for marine mammals and turtles in the areas that will be affected by the blasts. I have two major concerns about the Environmental Assessment:

- 1) The proposal to encircle the area surrounding the blast with a net has the potential to do more harm to marine mammals than the blasts themselves. Dolphins or manatees could become entangled in the net below the surface and drown. Bottlenose dolphins in the Wilmington area are already profoundly impacted by fishing net entanglements. A large net such as is proposed, in an area where dolphins are not accustomed to encountering nets, could be very dangerous. I think it would be more beneficial to focus on comprehensive monitoring efforts to ensure that no marine mammals are in the area prior to a blast. This may require the addition of aerial surveys prior to scheduled blasts, in addition to boat-based surveys.
- 2) In the event that sound levels are greater than those predicted by mathematical models, marine mammals may need to be kept outside an even wider radius than that specified. Actual sound levels will need to be measured with calibrated hydrophones during blasts to determine the affected radius.

I thank you for your consideration of my comments. Please feel free to contact me at (910) 962-2342 or at [SAYIGHL@UNCWIL.EDU](mailto:SAYIGHL@UNCWIL.EDU) if you have any questions.

Sincerely,

Laela S. Sayigh  
Assistant Professor

BIOLOGICAL SCIENCES

**BROOKS, PIERCE, McLENDON, HUMPHREY & LEONARD, L.L.P.**

ATTORNEYS AND COUNSELLORS AT LAW

RALEIGH OFFICE

1600 FIRST UNION CAPITOL CENTER  
150 FAYETTEVILLE STREET MALL (27601)  
POST OFFICE BOX 1800 (27602)  
RALEIGH, NORTH CAROLINA  
(919) 839-0300  
FACSIMILE (919) 839-0304

FOUNDED 1897

2000 RENAISSANCE PLAZA

230 NORTH ELM STREET

POST OFFICE BOX 26000

GREENSBORO, NORTH CAROLINA 27420

TELEPHONE: (336) 373-8850

FACSIMILE: (336) 378-1001

WRITER'S DIRECT DIAL

(336) 271-3120

E-Mail Address: [brooks@brookspierce.com](mailto:brooks@brookspierce.com)

March 31, 2000

James W. DeLony  
Colonel, U.S. Army  
District Engineer  
U.S. Army Corps of Engineers  
Wilmington District  
PO Box 1890  
Wilmington, NC 28402-1890

Re: Written Comments to the Environmental Assessment, February 2000, Preconstruction Modifications of Authorized Improvements, Wilmington Harbor, Brunswick County, North Carolina

Dear Colonel DeLony:

As you know, our firm represents the Village of Bald Head Island with respect to issues raised by the Environmental Assessment, February 2000, Preconstruction Modifications of Authorized Improvements, Wilmington Harbor, Brunswick County, NC. The Village appreciates the opportunity to provide written comments on the assessment, and plans to provide its comments in two parts. This is the first part. We ask that the Corps accept as written comments on this assessment the following correspondence:

1. Letters that Mr. Erik J. Olsen, the Village's coastal engineering consultant, has sent to the Corps concerning the sand management issues of concern to the Village:

October 20, 1999, letter from Mr. Olsen to you, and enclosures (Figures 1, 2 & 3)

August 16, 1999, letter from Mr. Olsen to you

July 21, 1999, letter from Mr. Olsen to Mr. Meshaw, and Exhibits:

Exhibit 1. July 2, 1999, letter from Mr. Olsen to Mr. Meshaw

Exhibit 2. March, 1999 Position Paper.

2. A. August 23, 1999, letter from Kathlyn J. Henson, (formerly) Mayor, Village of Bald Head Island, to Michael F. Easley, Attorney General, State of North Carolina, concerning the Wilmington Harbor Project.



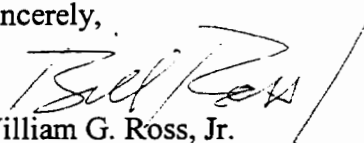
- B. August 31, 1999, letter from Robin W. Smith, (formerly) Special Deputy Attorney General, to Mayor Henson. (Ms. Smith is now Assistant Secretary for Environmental Protection, NC DENR.)
3. January 19, 2000, letter from John N. Morris, to Harry Simmons, Chairman, Brunswick Beaches Consortium, concerning the availability of additional sand.

We understand that you already have Mr. Olsen's correspondence. If we need to provide additional copies, please advise. We enclose the other correspondence.

The second part of the Village's comments we have not yet finished work on. The preparation of those comments has been slowed by our ongoing efforts with the project sponsors to resolve certain issues about sand management in the Wilmington Harbor project. As we have reported to project sponsor representatives, we expect to be in a position shortly to submit the second part of the Village's written comments. We will submit them as soon as possible, but no later than April 10, 2000.

Thank you for your cooperation and consideration of the Village's comments.

Sincerely,



William G. Ross, Jr.

Enclosures

cc: Frank Yelverton  
Freeman A. Berne, Mayor, Village of Bald Head Island

October 20, 1999

Colonel James W. DeLony  
District Engineer  
Department of the Army  
Wilmington District, Corps of Engineers  
P. O. Box 1890  
Wilmington, NC 28402-1890

Action: PM  
CF: DE  
DX  
DP  
DD  
OC  
PAO  
RG  
TS  
SUS: 4 Nov  
99



Coastal Engineering

Re: Wilmington Harbor Navigation Project - Ocean Bar Channel Realignment

Dear Colonel DeLony:

The Village of Bald Head Island understands that the Department of the Army, Wilmington District, Corps of Engineers is preparing and will soon issue an Environmental Assessment concerning the Ocean Bar Channel Realignment. Recognizing that it will be easier for the Wilmington District, in preparing the E.A., to consider submittals made now rather than later, the Village has asked me to update and summarize my information, views and comments on the above-referenced federal navigation channel work element.

Since the Village of Bald Head Island has already made comment on several occasions to the District regarding the realignment of the channel through Bald Head Shoal, we would have preferred to wait to make this submittal until after we have had a chance to review the draft *Sand Management Plan* which we understand the Wilmington District engineering staff is developing now. However, the Village was concerned that the delay might prevent the following information from being considered as you prepare the Environmental Assessment.

Due to its location at the mouth of the Cape Fear River and because the selected realignment alternative will move the channel significantly closer to Bald Head Island, the Village of Bald Head Island is vitally interested in the draft *Sand Management Plan*. We know that Mr. Tom Jarrett, P.E. Chief of the Coastal, Hydrology and Hydraulic Section, has been designated as the professional responsible for the formulation of the draft *Sand Management Plan*. We appreciate the efforts that Mr. Jarrett and others in the Wilmington District are putting into this Plan, and we look forward to the opportunity to provide comment on the District's Plan, as well as on the environmental review documents and any other related reports which follow.

Against that background, here is how we evaluate the effects of the ocean bar channel realignment on littoral processes and erosion to the beaches on Bald Head Island, and how we address the question as to whether mitigation is required to offset associated sand losses.

**olsen**  
associates, inc.

4438 Herschel Street  
Jacksonville, FL 32210  
(904) 387-6114

Col. James W. DeLony  
Page Two of Three  
October 20, 1999

Historically, navigation project construction and entrance channel maintenance have caused large scale adverse morphological changes to the shoreline and sand-sharing system of Bald Head Island. However, the quantification of those historical effects has not yet been resolved in such a way as to allow for appropriate remediation by the Corps of Engineers.

Within recent years, the coastal engineering profession has begun to embrace the concept of Sediment Budget formulation at improved inlets, or river entrances, for purposes of quantifying and ultimately mitigating shoreline impacts and sediment deficits caused by navigation projects. Interestingly, the results of a related study performed by the Wilmington District as early as 1989 qualitatively described the overall effect of the Cape Fear Navigation Channel on the sand sharing system seaward of Bald Head Island. Figures 1 and 2 (enclosed) were prepared by the District staff for a previous reconnaissance level Section 111 assessment. Although the report could not provide an adequate nexus between continued *maintenance dredging* in the Cape Fear River entrance channel and the acceleration of erosion at the west end of Bald Head Island, the analyses depicted by Figures 1 and 2 clearly represent the magnitude of long term impact to the island's sand sharing system. It is important to note that the District's Section 111 Study rendered conclusions and recommendations only on the impacts of "continued project maintenance" and not on the issue of overall project construction. Given the modern day concept of a *Sand Management Plan*, I assume that historical impacts, as well as those predicted to occur with the entrance channel realignment presently under consideration, can now be appropriately addressed for purposes of project-related mitigation.

From a sediment budget perspective, it is abundantly clear that any sand removed seaward of project station 90+00 for the revised bar channel reconfiguration, will be derived solely from the sand sharing system of Bald Head Island (See Figure 3). The existing Cape Fear River entrance channel, by virtue of its interruption of historical sand bypassing at Bald Head Island (ref. Figures 1 & 2), provides a clear distinction as to where the existing sand sharing system of Bald Head Island begins. Accordingly, a rational Sand Management Plan should ideally mandate that sand associated with both channel realignment and future maintenance (seaward of sta. 90+00) *not* be removed from that system for other purposes unless prevention and mitigation of impacts has been provided for. If there is any lesson which can be learned from the construction and maintenance of the existing Cape Fear River entrance channel, it is that its realignment as proposed will serve to significantly deflate the existing offshore shoal formations seaward of Bald Head Island – unless no net deficit to the littoral budget can be maintained.

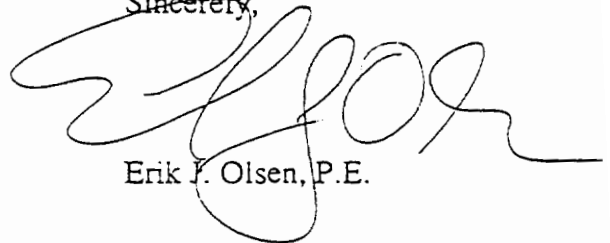
Col. James W. DeLongy  
Page Three of Three  
October 20, 1999

Concurrent with the Wilmington Harbor Deepening Project, the Wilmington District has requested comment on the potential use of area beaches, including the beaches of Bald Head Island, as potential sites to receive dredged sediment. As we understand it, the primary source of the sediment to be utilized for beach disposal are the shoals seaward of Bald Head Island. We believe that any proposal for beach placement of sand on area beaches must first evaluate adequately the issues of concurrent impact, prevention and/or mitigation to the sand sharing system of Bald Head Island. In addition, any such proposal must comply with the North Carolina statute that requires "that beach quality material be placed on downdrift beaches, or if placed elsewhere, an equivalent amount from another source shall be placed on downdrift beaches." In Brunswick County, the Bald Head shorelines constitute the *only* beaches *downdrift* of the ocean entrance channel to the Cape Fear River. Unless these concerns are appropriately addressed by way of the *Sand Management Plan* and *Environmental Assessment*, I believe that the Village of Bald Head Island should strongly oppose the entire channel realignment program. There is therefore no logical reason why the Village of Bald Head Island should accept the predictable adverse consequences of entrance channel modification without the benefit of both advance and long-term project damage prevention, or mitigation, which is appropriately designed, implemented and guaranteed by the Corps of Engineers and the non-federal project sponsor.

Again, we look forward to receipt of the District's Draft Plan addressing this matter and the opportunity to initiate any dialogue necessary to negotiate terms or guarantees acceptable to the Village of Bald Head Island which will adequately protect the Village's long term interests.

Thank you for your attention to these comments, views and information to the file.

Sincerely,

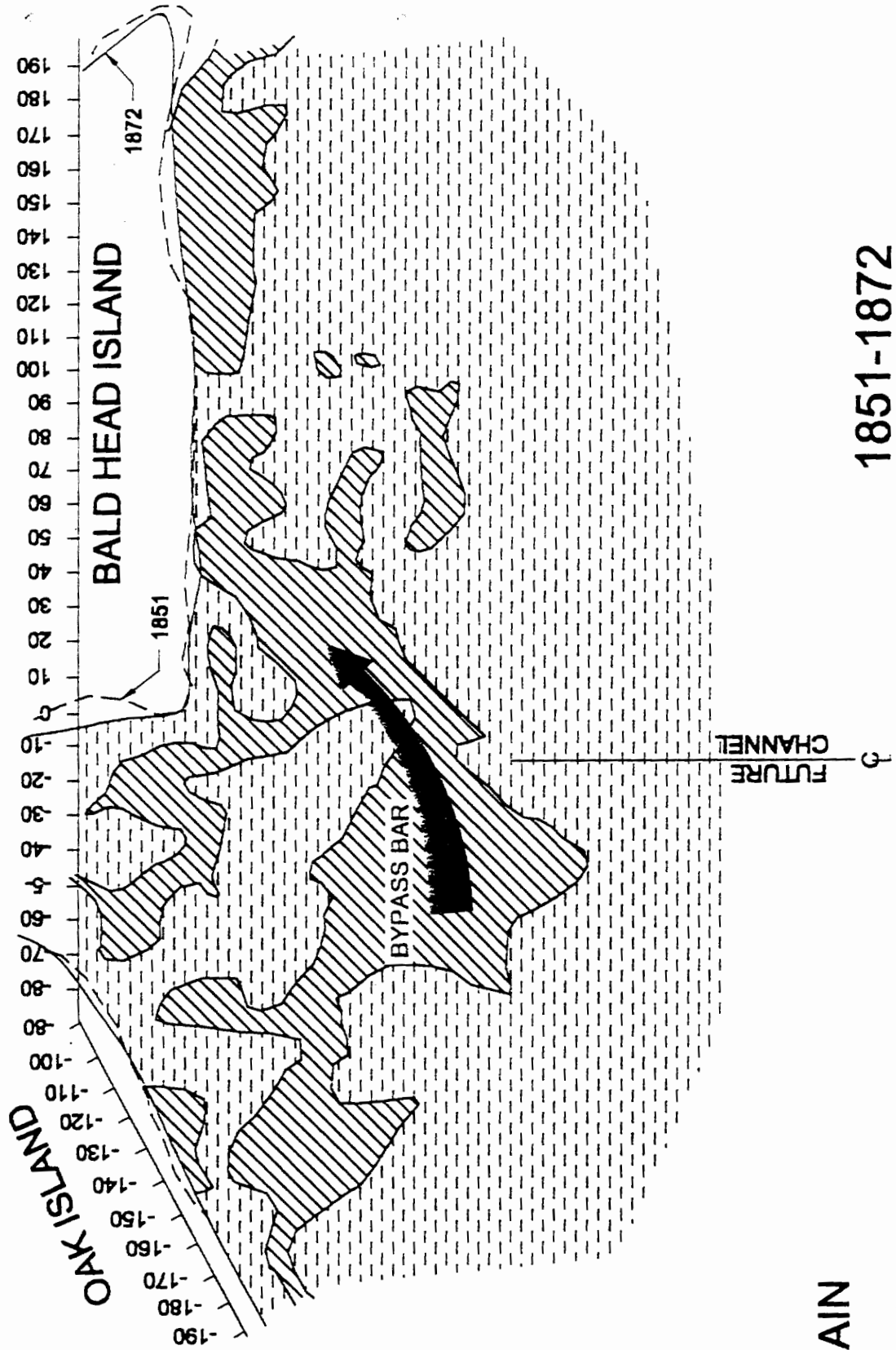
A handwritten signature in black ink, appearing to read "E. Olsen", with a long horizontal flourish extending to the right.

Erik J. Olsen, P.E.

EJO:fm

Enc: Figures 1, 2 & 3

cc: John N. Morris, Director, Division of Water Resources, NCDENR  
Village of Bald Head Island Council  
George W. House, Esq., and William Ross, Jr., Esq.

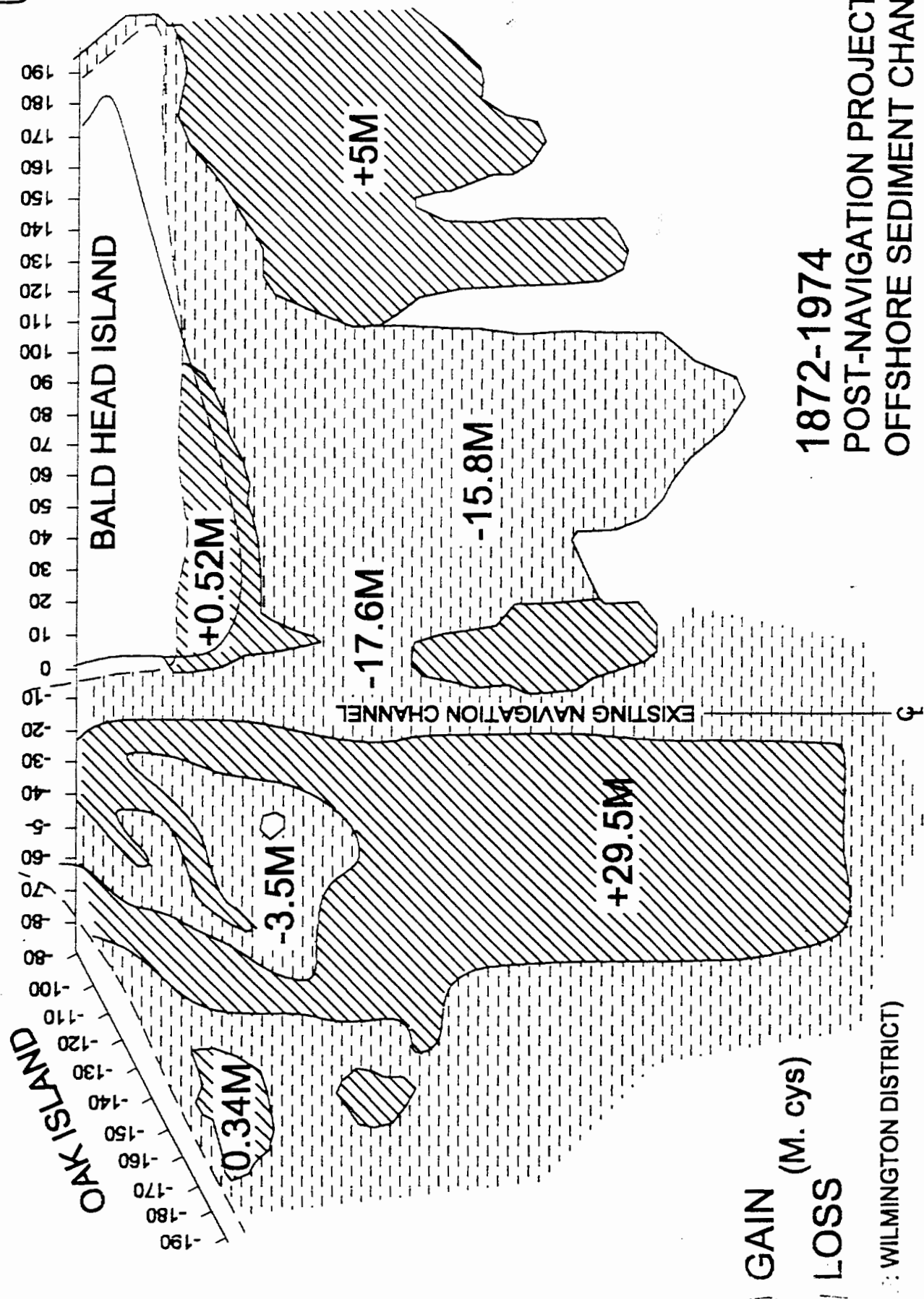


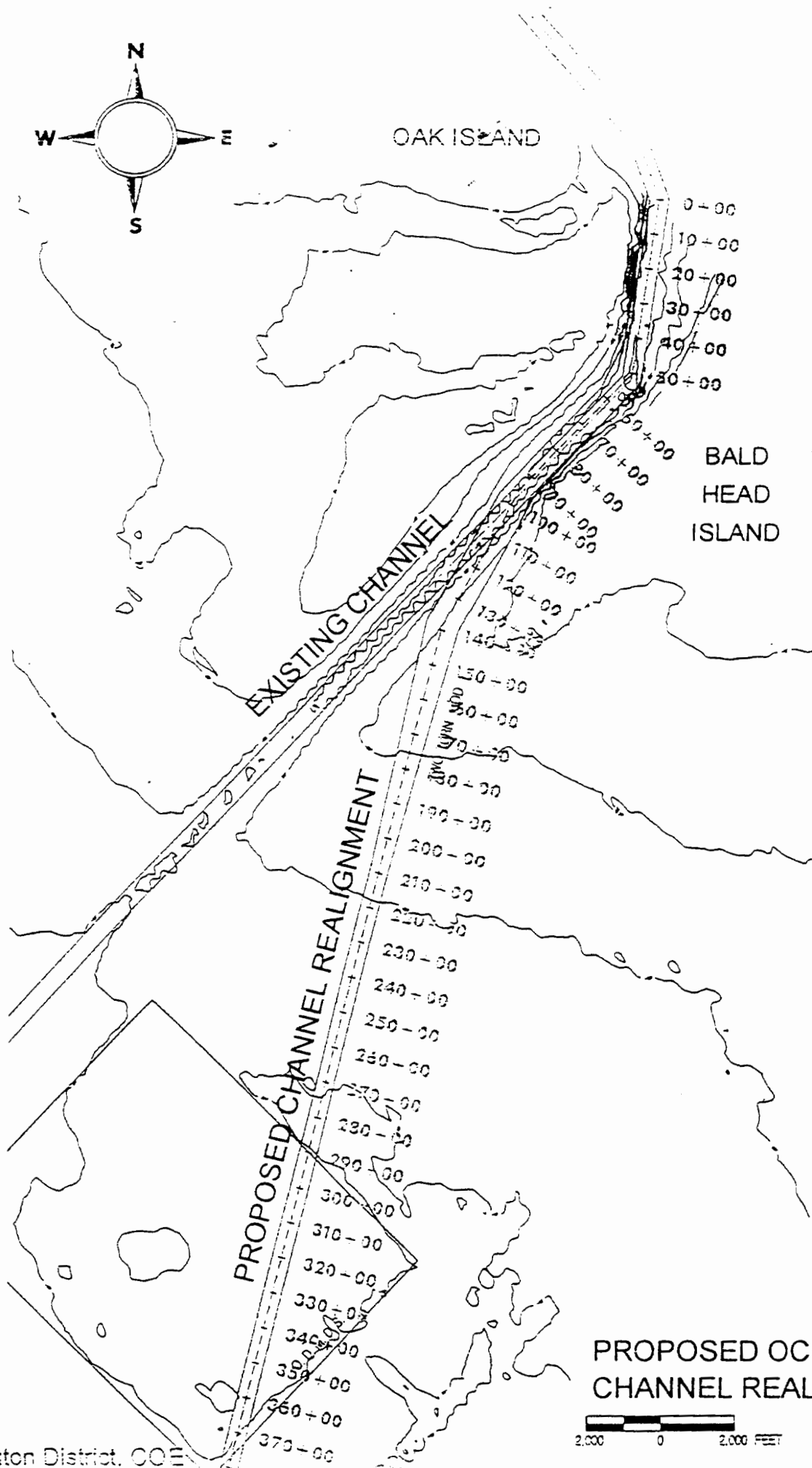
 GAIN

 LOSS

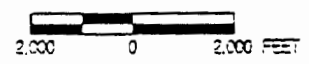
REF: WILMINGTON DISTRICT)

1851-1872  
PRE-PROJECT  
OFFSHORE SEDIMENT TRENDS





PROPOSED OCEAN BAR  
CHANNEL REALIGNMENT





December 2, 1999

Project Management Branch

Mr. Erik J. Olsen, P.E.  
Olsen Associates, Inc.  
4438 Herschel Street  
Jacksonville, Florida 32210

Dear Mr. Olsen:

This is in response to your letter of October 20, 1999 concerning the Wilmington Harbor Ocean Bar Channel Realignment. The assumption that we will soon issue an Environmental Assessment (EA) addressing the ocean entrance channel realignment is correct. We plan to make the EA and Sand Management plan available for public review in mid-December.

We have your previous letters regarding the entrance channel realignment and have considered your comments in preparation of the EA and Sand Management plan. In addition we met with you and officials from the Village of Bald Head Island to discuss issues related to the Sand Management plan on November 18, 1999.

We have completed our shoreline impact analyses and the findings will be presented in the Sand Management plan. Our analyses include a review of the shoreline responses to the beaches east and west of the Cape Fear River inlet related to the existing ocean entrance channel alignment and the proposed alternate ocean entrance channel alignment.

There is insufficient historic evidence to support the claim that the navigation project has adversely affected the Bald Head Island shoreline or the sand sharing system. Comparison of historic shoreline positions following the initial project construction and maintenance, dating from the 1880's through the mid 1940's, indicate that Bald Head Island accreted over 2,000 feet in some areas in response to the morphological changes caused by the project. From the mid 1940's to the mid 1970's, the island's shorelines were relatively stable. This in spite of the continued maintenance and incremental deepening of the harbor project. The severe erosion being experienced on South Beach did not begin until 1975. The cause of this recent erosion has not been definitely identified, but other factors, such as shifts in the configuration of Bald Head Shoal or changes in the size and location of nearshore flood channels next to the west end of South Beach have been suggested as possible causative factors. The brief pre-project history of the area actually indicates that Bald Head Island was experiencing extensive erosion along South Beach.

The Wilmington District is very much aware of the art of sediment budget development and was one of the first if not the first Corps of Engineers Districts to use the technique in assessing the impacts of navigation projects and natural tidal inlets on sediment transport and associated shoreline response. However, attempts to develop a sediment budget for the Cape Fear River Entrance proved unsuccessful due to the configuration and size of the ebb tide delta of the entrance which encompasses over half of Bald Head Island and the east end of Caswell Beach. In other words, these island shoreline segments are within the inlet system and therefore subject to sediment transport process associated with tidal flow in and out of the entrance as well as littoral processes. In any event, no cause and effect relationship has ever been established between the existing project and the response of the shoreline on either side of the entrance. Accordingly, mitigation of project related shoreline impacts is not a part of the sand management plan for the Wilmington Harbor 96 Act project.

The sand management plan for the deeper project does include beach disposal of the littoral sands that will be trapped in the entrance channel. This is a major change in the maintenance procedure presently being used in which all of the material shoaling the entrance channel is deposited in offshore disposal areas. This change in the maintenance practice is being adopted in recognition of non-renewable nature of these littoral sands and the potential impacts that could be associated with the continued removal of this limited resource from the littoral system. The present cost analysis indicates that beach disposal of the littoral material is also the least cost option. However, if beach disposal resulted in some additional cost, the Corps of Engineers, under authority of Section 207 of the Water Resources Development Act of 1996, could elect to use a slightly more costly disposal method if there are overriding environmental and erosion control benefits associated with the more costly disposal scheme. Since placing the dredged material directly on the beach will control erosion and improve the overall condition of the adjacent beaches, particularly with regard to sea turtle nesting, the Corps plans to use beach disposal of the littoral material for the life of the deeper project. The present sand management plan calls for the placement of approximately 1 million cubic yards on Bald Head Island in years 2 and 4 following initial deepening with approximately 1 million cubic yards deposited on the east end of Oak Island and Caswell Beach in year 6 following deepening. This 6-year disposal cycle would then be repeated for the life of the project. The end result of this disposal plan would create an average annual deposition of 333,000 cubic yards/year on Bald Head Island and 167,000 cubic yards/year on east Oak Island-Caswell Beach. The 2 to 1 distribution of littoral shoal material is based on an assessment of littoral sand transport patterns in the vicinity of the Cape Fear River Entrance.

Construction of the bar channel along its new alignment will be accompanied by a reorientation of the shoals lying immediately adjacent to the new navigation channel. A wave transformation-sediment transport potential analysis was performed to determine the possible impacts of these shoals and channel realignments on littoral sand transport on the adjacent islands. For the case of the realigned channel, both Jay Bird Shoal and Bald Head Shoal were

rotated to parallel the new bar channel. Incident waves were propagated over these realigned shoals and the bar channel to the shoreline from which sediment transport potentials were computed. These potential sediment transport rates were compared to similar results obtained for the existing condition with the result being no significant difference in sediment transport potential on either Bald Head Island or East Oak Island-Caswell Beach. While there is no theoretical evidence that the realigned channel will negatively impact the adjacent islands, the maintenance portion of the sand management plan, which will place littoral material on the adjacent beach on a routine basis, should compensate for any unidentified impacts. In addition, a beach monitoring program will be permanently established to measure the response of the adjacent beaches to the new channel. This monitoring program will be used to make necessary adjustments in the distribution and point of placement of the maintenance material.

The sediment change patterns shown on Figures 1 & 2 referenced in your letter (which were developed by the Corps) do not show a clear picture of the sand sharing system of Bald Head Island. Perhaps you could provide additional information on this interpretation. With regard to the sand management plan, since there is no clear or definable impact of the initial channel dredging on either East Oak Island-Caswell Beach or Bald Head Island, the base disposal plan for the new work material was based on the least costly disposal method. Since mitigation of the new channel is not an issue with the Corps, redistributing the material to the other beach areas in accordance with the Section 933 Plan is within the purview of the Corps of Engineers. With regard to the O&M portion of the sand management plan, the proposal to distribute material in a ratio consistent with the computed sediment transport rates moving toward the entrance from either side is a rational plan.

The Corps does not agree that the realigned channel will cause any additional deflation of the existing offshore shoal system. Comparisons of hydrographic surveys of the area made in 1974 and 1995 indicate that the area offshore of Bald Head Island has actually been gaining material while the immediate nearshore area of Bald Head Island has been getting slightly deeper. Realignment of the channel would not change this tendency. In any event, the disposal of the O&M material on the adjacent beaches will maintain the littoral sediment budgets of the adjacent islands.

First, the Corps does not agree that mitigative measures are an issue on Bald Head Island (or East Oak Island-Caswell Beach for that matter) for the new channel. We have not identified any negative impacts to the adjacent beaches associated with the new channel. Secondly, the Corps maintains that we have proposed an equitable sand management plan, particularly with regard to the disposal of maintenance material, that will serve to enhance beach stability on both sides of the entrance by preserving the existing sediment budget of the region. Accordingly, the Corps proposes to take reasonable and prudent measures to assure that the Wilmington Harbor deepening project does not adversely affect the islands on either side of the entrance.

Should you have questions or concerns about any of the above information we would be glad to meet with you at your convenience. Also, if you would submit your analyses of shoreline responses, we would be glad to review and compare them to our own. Thank you for your letter and I look forward to our meeting.

Sincerely,  
JOHN F. JACOBS III  
Major, U.S. Army  
Acting District Engineer  
James W. DeLony  
Colonel, U.S. Army  
District Engineer

Copies Furnished:

Mr. Freeman A. Berne, Mayor  
Village of Bald Head Island  
Post Office Box 3009  
Bald Head Island, North Carolina 28461

Mr. John N. Morris, Director  
Division of Water Resources  
North Carolina Department of Environment  
and Natural Resources  
1611 Mail Service Center  
Raleigh, North Carolina 27699-1611

Mr. Harry Simmons, Chairman  
Brunswick Beaches Consortium  
707 Caswell Beach Road  
Caswell Beach, North Carolina 28465

BCF:  
TS-EC/Jarrett

August 16, 1999

Colonel James W. DeLony  
District Engineer  
Wilmington District, USACOE  
P.O. Box 1890  
Wilmington, NC 28452-1890



Coastal Engineering

Re: Wilmington Harbor Navigation Project - Ocean Bar Channel Realignment

Dear Colonel DeLony:

As the coastal engineering representative of the Village of Bald Head Island, I would like to bring to your personal attention, a pending issue which you have inherited in your assumption of command of the Wilmington District, COE. Specifically, the matter involves the Ocean Bar Channel Realignment which is a work element of the proposed improvements to the Wilmington Harbor Navigation Project.

Bald Head Island is the coastal barrier island most proximate to the outer channel realignment and will initially suffer a loss of 6 to 8Mcy of beach quality material from its sand sharing system as a result of project implementation. Construction of the realigned channel and its future maintenance are therefore expected to adversely affect Bald Head Island's two abutting shorelines. Several recent submittals related to this issue have been made to the Wilmington District reflecting the Village's request for both initial and long-term mitigation. The Village is likewise seeking prioritization in the sequence of work required to dredge the outer channel realignment. Although your staff is knowledgeable of both the Village's public position and intentions regarding actions potentially necessary to protect their interests, we think that you may want to personally avail yourself of various facts which could necessitate the Village formally intervening with project construction.

A continuing concern is that the Project Management Branch of the Wilmington District may not fully appreciate the Village's position in this regard. As of this date, Project Management is procedurally addressing the Village's requirements solely as an element of the Brunswick Beaches Consortium -- irrespective of Bald Head Island's unique physiographic relationship to the entrance channel and the Village's express request for direct consideration as an affected party. For example, it is generally agreed that Bald Head Island has been adversely impacted historically by the maintenance of the navigation channel at its present location. More importantly, it is relatively clear that impacts to the island's sand sharing system will be significant and far reaching with the pending realignment of ocean channel segment.

**olsen**  
associates, inc.

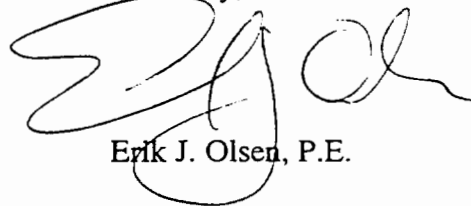
4438 Herschel Street  
Jacksonville, FL 32210  
(904) 387-6114  
(Fax) 384-7333

Col. James W. DeLony  
*Page Two of Two*  
*August 16, 1999*

Accordingly, the Village of Bald Head Island has initiated measures to ensure its future protection. As a part of that effort, we have made several detailed submittals to the District as part of the EA process for purposes of developing a record. Copies of those submittals are attached for your personal review. We would appreciate your assistance in this matter and future guidance needed to ensure project success on all counts.

Thank you.

Sincerely,

A handwritten signature in black ink, appearing to be 'EJO', written over the word 'Sincerely,'.

Erik J. Olsen, P.E.

EJO:lfm

cc: Village of Bald Head Island Council  
Wade Horne, Village Manager  
John Meshaw, CESA  
Wayne Bissett, CESA  
Tom Jarrett, CESA

Enc: Col. DeLony (only)

July 21, 1999

District Engineer  
U.S. Army Corps of Engineers  
Wilmington District  
P.O. Box 1890  
Wilmington, NC 28402-1890



Coastal Engineering

Attn: Mr. John Meshaw, (CESQW-TS-PE)

Re: Wilmington Harbor Navigation Project - Ocean Bar Channel Realignment  
Comments To The File

Dear Mr. Meshaw:

This letter is submitted to the District on behalf of the Village of Bald Head Island and constitutes a second response to your Request-For-Comments dated June 22<sup>nd</sup>, 1999 regarding the above-referenced project improvements. This information serves to augment both our comments dated July 2, 1999 (see Exhibit No. 1) and a "Position Paper" dated March, 1999 (see Exhibit No. 2). The comments presented herein address both the selected entrance channel alignment, which will directly impact the existing Bald Head Island shoreline, and our ongoing request to the District regarding long-term project mitigation, appropriately placed beach disposal, and the placement of sand at Bald head Island during sea turtle nesting season of Year 2000. Accordingly, please consider the following additional information submitted to the file:

#### 1.) Project Impacts

a.) **Sediment Budget** - The proposed entrance channel realignment proposes to excavate well in excess of 6M cy of high quality sand from the existing *sand sharing system* directly seaward of Bald Head Island (BHI). For purposes of discussion, the latter can be considered to be all offshore portions of the seabed eastward of the existing Wilmington Harbor entrance channel centerline. In addition, project construction will remove several million cubic yards of "mixed quality" sand, (i.e., materials with greater than 10% fines) from existing shoals directly seaward of BHI.

It is reliably predicted that the adjacent shoal system seaward of BHI will adjust to the new channel alignment -- thereby resulting in the requirement for the continued removal of sand by maintenance dredging from the channel fairway as well as from project wideners. Within the first 10 years, or more, following entrance channel reconfiguration, the continuing loss of material from the BHI sand sharing system due to maintenance will be significant.

**olsen**  
associates, inc.

4438 Herschel Street  
Jacksonville, FL 32210  
(904) 387-6114  
(Fax) 384-7368



*It is the position of the Village of Bald Head Island that the cumulative removal of material from the adjacent seaward sand-sharing system of Bald Head Island must be adequately mitigated by the project sponsor and the Wilmington District, COE.*

b.) **Alongshore Sediment Transport Potential** - A 2<sup>nd</sup> source of anticipated impact to Bald Head Island as a result of entrance channel construction is a modification of alongshore littoral transport potential. Although the District staff is performing analyses of this phenomenon, it is acknowledged that its quantification is often difficult -- particularly, with the type of bathymetric conditions under consideration. Hence, predicted positive or negative changes in littoral transport potential often result in non-conclusive opinions regarding impacts, or the lack thereof.

*It is the position of the Village of Bald Head Island that any identification of project related mitigation predicated solely upon variations in littoral transport at BHI will be unacceptable. The Village will be satisfied with nothing less than mitigation based upon readily identified and easily quantified sediment budget impacts as discussed in item "a" above.*

c.) **Current Flow Field Modification** - The impinging hydraulic flow of the existing navigation channel along West Beach at BHI is considered to be a factor contributing to existing shoreline erosion at that location. Proposed channel modifications within the Jay Bird shoals segment of work could exacerbate existing West Beach impacts by way of increased flow magnitude. Moreover, the reorientation of the channel seaward of BHI from sta. 90+00 seaward could result in a meander phenomenon type impact along the West Beach shoreline between sta. 0+00 and sta. 60+00. The District has not performed any level of numerical hydrodynamic modeling to address such impacts.

*It is the position of the Village of Bald Head Island, that the District must recognize, monitor and directly mitigate, as necessary, any reconfiguration of the West Beach shoreline resulting from entrance channel reorientation. Such mitigation could potentially require structures necessary to restrict channel migration in the future.*

## **2. Timing of Mitigation**

It is relatively clear that no landform adjacent to the Wilmington Harbor Entrance Channel has been more adversely affected over time than BHI. Similarly, it is reasonable to assume that due to the reorientation of the entrance channel from sta. 90+00 seaward, BHI will experience substantial immediate and long term impacts to its sand sharing system. Hence, the timing of beach disposal operations at Bald Head is extremely important with respect to the mitigation of project impacts.

*It is the position of the Village of Bald Head Island that the Wilmington District should initiate a contract sufficient to allow for beach disposal at Bald head Island at as early a date as possible during Year 2000. It is the opinion of the Village that a favorable Section 7 Consultation can be achieved in order to sufficiently protect sea turtle nesting at Bald Head Island during summer construction. The Village has volunteered to assist the District in this regard.*

### **3. Brunswick Beaches Consortium (BBC)**

The Wilmington District has formulated a tentative broad-based, countywide beach disposal program utilizing the 8M cy+ of beach quality sand to be excavated as a result of the Entrance Channel improvements. As discussed above, the vast majority of that sand will be derived solely from the sand sharing system of BHI and as such must be ultimately mitigated for (by the District and the project sponsor) at that location.

Although the Village of Bald Head Island is a contributing member of the BBC, neither the potential lack of fiscal resources nor the global interests of that entity, or its individual members, should influence in any way the Wilmington District's beach disposal scheduling or mitigation requirements for Bald Head Island. The Village of BHI has the resources, expertise and intentions of assisting the District in the construction of a suitably sized beach disposal project at as early a date as possible next year. Based upon the total length of shoreline along South Beach and West Beach at BHI subject to sand placement, the District proposal of an initial disposal of 1.5M cy of sand at that location is considered to be insufficient to meet current needs and potential near term impacts of entrance channel realignment.

*The Village of Bald Head Island does not object to the initial construction of beach disposal projects at other Brunswick County locations which seek to maximize public benefits associated with channel construction. It is the position of the Village of BHI, however, that such disposal efforts must not reduce the direct mitigation commitments which need to be obligated at BHI for purposes of addressing both project construction and future maintenance.*

### **4. Legal Action(s)**

As of this date, the Village is laboring under the assumption that the Environmental Assessment (EA) and other studies, or analyses, being prepared by the Wilmington District, COE will both adequately and equitably address the mitigation requirements of BHI. Those mitigation considerations should address a Beach Disposal Plan at that location which obligates both an adequately sized initial effort as well as the continued disposal of future maintenance material that consists of sand, at no cost to local interests.

Meshaw/Wilmington District

Page Four of Four

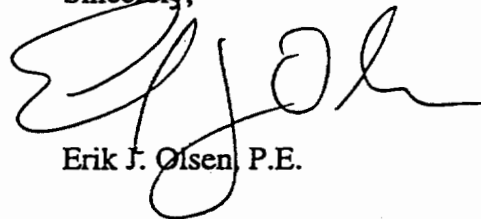
July 21, 1999

*Without an appropriate finding and adequate assurances required to provide comprehensive project mitigation at BHI, the Village will consider legal recourse to protect its interests. Although it is not our intent, such legal action could unfortunately delay the proposed entrance channel improvement project.*

The Village of Bald Head Island appreciates the District's consideration of this submittal in your formulation of the final EA and attendant project formulations necessary to allow for construction of the reconfigured Wilmington Harbor Entrance Channel.

Thank you.

Sincerely,

A handwritten signature in black ink, appearing to read 'EJO', with a stylized flourish extending from the end.

Erik J. Olsen, P.E.

EJO:lfm

Enc:

cc: Kitty Henson, Mayor  
Wade Horne, Village Manger  
Tom Jarrett, P.E.  
W. Bissett, P.E.

# EXHIBIT No.1

July 2, 1999

District Engineer  
US Army Corps of Engineers  
Wilmington District  
P.O. Box 1890  
Wilmington, NC 28402-1890



Coastal Engineering

Attn: Mr. John Meshaw, (CESAW-TS-PE)

Re: Wilmington Harbor Navigation Project - Ocean Bar Channel Realignment

Dear Mr. Meshaw:

This letter is submitted to the District on behalf of the Village of Bald Head Island and is in response to your solicitation of June 22<sup>nd</sup>, 1999 regarding the above-referenced project improvements. As the District files will show, the Village has requested beach disposal along the entirety of both West Beach and South Beach. Similarly, the Village is prepared to accommodate 3M cy or more of sand (in-place) in a design configuration (see attached correspondence dated June 14, 1999 to D. Wayne Bissette, P.E.).

As a result of chronic beach erosion, the Village of Bald Head Island requests an initiation of sand placement at as early a date as possible in Year 2000. Accordingly, we strongly urge the District to initiate a Section 7 Consultation for purposes of allowing beach fill placement during the turtle nesting season next year. I have both personally met and discussed this recommendation with various District staff. Accordingly, we are gratified that the District is presently considering this option by way of soliciting public comment.

It is our opinion that a favorable Section 7 Biological Opinion can be rendered by the U.S.F.& W.S. sufficient to allow oceanfront construction during turtle nesting season at Bald Head Island next year. We are relatively confident in that regard for the following reasons:

- The beaches of Bald Head Island are sufficiently eroded such that large scale nest relocation is presently necessary in order to protect the species,
- The local Bald Head Island Conservancy is well skilled at implementing a suitable *Sea Turtle Protection Plan* during the period of construction. Note - the Village is presently seeking the support of the Conservancy's Board in this regard.

olsen  
associates, inc.

4438 Herschel Street  
Jacksonville, FL 32210  
(904) 387-6114  
(Fax) 384-7068

- The placement of sand at Bald Head Island beginning in April of 2000 will advance both the Navigation Project construction schedule as well as the attendant COE beach disposal plan for other locations within Brunswick County, and
- The allowance of sand placement during turtle nesting season in areas where impacts can be avoided will allow for the preservation and beneficial use of over 8M cy of beach quality sand. Conversely, the placement, or transfer, of this resource to the ODMDS or other non-beach locations, due to scheduling constraints, would constitute an extremely significant adverse physical and economic impact to Brunswick County.

For the record, we would note that the Village formally objects to the potential placement of sand on their beaches where disposal is "limited to the area below the high tide line," as described in the District's Request For Information dated June 22, 1999. It is our position that the placement of disposal material in an appropriate beach nourishment design configuration will render the greatest level of protection to both existing development and endangered species. With regard to future turtle nesting habitat, it should be intuitively obvious that the highest level of benefit will be achieved through the construction of a wide, dry beach berm which exhibits longevity after restoration. The latter would be expected to provide the longest duration of nesting habitat, thereby offsetting the continuing need to relocate nests along any section of erosional shoreline so improved. Furthermore, we do not know of any scientific data, or turtle impact studies, which argue for sand placement below the MHWL. Our firm's collective personal observation is that sand placement at that location to either avoid Easement requirements, or to placate environmental "concerns," ultimately compromises nesting habitat. That is to say, such placement techniques commonly result in a saddle, or low area, in the beach between the existing dune or upland and the outer limit of sand fill. Such low areas can subject nests to inundation -- as well as obscure turtle crawl processes both during nesting and hatchling return to the ocean. Hence, such fill placement techniques should be avoided due to potential adverse impacts to the species.

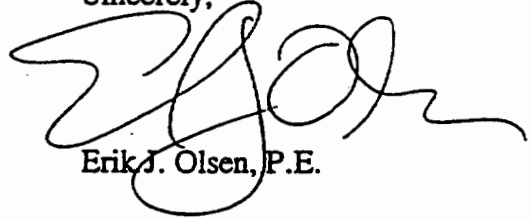
In summary, the Village supports the placement of beach compatible materials, but only in a strategic design configuration. It is the Village's intent to provide the District with a preferred design plan to be incorporated into project contract documents. The Village opposes the placement of beach quality sand within the ODMDS or in the nearshore littoral zone. The Village does not object to the placement of non-beach compatible material within the old ocean bar channel; however, it is requested that the Wilmington District develop a protocol for the definition of non-sandy sediments mutually acceptable to the Brunswick Beaches Consortium. The reconfiguration of the Cape Fear River Ocean Bar channel will necessitate both initial *and* long term mitigation at Bald

Page Three of Three  
July 2, 1999

Head Island. Hence, a disposal plan for sand derived from future channel maintenance is of significant interest to the Village of Bald Head Island.

Thank you for your consideration in these matters.

Sincerely,

A handwritten signature in black ink, appearing to read 'EJO', with a stylized flourish extending to the right.

Erik J. Olsen, P.E.

EJO:lfm

Enc:

cc: Wade Horne, Village Manager  
Bald Head Island Nature Conservancy, Inc.

### OPINIONS AND RECOMMENDATIONS REGARDING THE CAPE FEAR RIVER ENTRANCE CHANNEL AND BEACH EROSION AT BALD HEAD ISLAND, N.C.

Village of Bald Head Island  
March, 1999

#### *HISTORICAL PERSPECTIVE AND EXISTING CONDITIONS*

Since about 1974, beach erosion along Bald Head Island has been manifest as chronic and severe shoreline recession along the South Beach (most particularly the western portion) and selected reaches of the West Beach (ref. Figure 1). Most recently, erosion stress has accelerated along central South Beach. Long-term shoreline retreat has averaged over 30-ft per/yr at the former Inn location, 10 to 25 ft/yr elsewhere along the western portion of South Beach, and 3 to 5 ft/yr along the West Beach.

The island's erosion is the apparent result of several combined factors: (1) divergent alongshore sediment transport gradients, (2) tidal currents and proximity to the Cape Fear River Entrance, and (3) impacts of the adjacent federal navigation project.

Along South Beach, the net alongshore transport potential diverges at a nodal point between Sea Oats Trail and Silversides Trail. To the west, transport accelerates rapidly westward due to both wave and tidal current forces. To the east, transport accelerates rapidly eastward. Simplistically, this means that sand is stripped off of central South Beach and transported to the west and east. Toward the west, it deposits as a spit and/or is lost from the island to the Cape Fear River Entrance. To the east, predicted deceleration in the transport potential within 3000 ft west of the Point allows some deposition of this sand (and therefore local beach stability or periodic accretion), though most of the sand is ultimately lost to Frying Pan Shoals at Cape Fear.



Likewise, sand is lost from West Beach via wave stress that transports sand *northward* toward the marina entrance and marshes, and via ebb tidal currents that transport sand *southward* toward the spit between the South and West Beach. These ebb currents, in addition to the flood currents along South Beach, episodically "trim" the spit and ultimately move sand from the island toward the adjacent, deep navigation project channel. The proximity of West Beach to the federal navigation channel provides little width upon which to create (or enhance) a stable beach along much of the West Beach shoreline. The latter is similarly adversely affected by the orientation of the Smith Island Range navigation channel segment and the resultant directionality and impingement of ebb tidal flow upon the West Beach shoreline.

It is submitted that the construction and maintenance of the Cape Fear River Federal Navigation Project, at its current location, permanently interrupted the pre-existing natural sand bypassing system between Caswell Beach and Bald Head Island. Initially, the entrance channel severed the inlet's ebb tidal shoal, causing the eastern lobe (Bald Head Shoal) to migrate shoreward and onshore toward Bald Head Island. As a result, the western shore of the island responded by advancing some 1500 to 2000 feet between the late 1800's and the mid 1920's.

Between about 1925 and 1971, the net shoreline location remained relatively stable; however, during the same period, the submerged portions of the offshore shoal that had led to the previous unprecedented accretion were eroding as a result of the navigation project channel's interruption of easterly sand drift. Beginning in about 1974, the shoreline abruptly responded to the eroding seabed and commenced a trend of rapid retreat -- reaching 60 feet per year along portions of the recently developed Bald Head Island oceanfront.

It appears, therefore, that the island's present day beach erosion trend results predominantly from ongoing "deflation" (recession) of the beach growth that occurred in the early 1900's when Bald Head Shoal migrated onshore. That migration was associated with the early navigation project's severance of the natural ebb tidal shoal. The island's oceanfront was developed when the shoreline was at the anomalously advanced location that had resulted from the onshore movement of the severed shoal. The existing navigation project's continued interruption of the Cape Fear River sand bypassing system, including the historic removal of sand from the system by maintenance dredging, has led to the retreat of this "advanced" shoreline location and is expected to continue to contribute to beach erosion and shoreline recession in the future. It is likely that proposed navigation project improvements, and in particular realignment of the existing entrance channel, could further exacerbate the condition.

## ***PRIOR FEDERAL ACTIONS***

In 1989, the Wilmington District, US Army Corps of Engineers, performed a Section 111 Reconnaissance Report at the request of the Village of Bald Head Island. The purpose of this preliminary study was to make an initial determination as to whether or not continued dredging of the Cape Fear River entrance channel was causing or accelerating erosion on the Island. Authority for the investigation was provided by Section 111 of the Rivers and Harbors Act of 1968.

The District concluded at the time that "no evidence exists to connect the severe erosion of the west end of Bald Head Island with maintenance dredging in the Cape Fear entrance channel." Hence, mitigation of the erosion under Authority of Section 111 was not determined to be warranted.

The District, however, did favorably determine that placement of beach quality, dredged material recovered from the Cape Fear River entrance channel on the westward end of Bald Head Island was feasible and satisfied the criteria necessary for 50-50 cost sharing under the provisions prescribed by Section 933 of WRDA (1996).

Likewise, in 1989, the coastal engineering firm of Olsen Associates, Inc. as consultant to the Village, rendered a contradictory opinion regarding the probability of a cause and effect relationship between ongoing erosion trends at Bald Head Island and the construction and maintenance of the adjacent navigation channel. Pragmatically, however, the firm noted that Section 111 of the Rivers and Harbors Act of 1968 held virtually no promise as a potential mechanism for seeking federal mitigation, solely on the basis that it requires a concurrent congressionally authorized Shore Protection Project. Accordingly, even if the federally constructed navigation works were definitely proven to have had a large scale quantifiable adverse impact on Bald Head Island, Section 111 expenditures by the Wilmington District to resolve the problem could, in all probability, not be made due to Policies implemented by Higher Authority.

As a result, Olsen Associates, Inc. supported the District's finding that beach disposal via Section 933 constituted the most advantageous (and timely) opportunity for initiating a program of erosion control along South Beach at Bald Head Island. Since that date, two Section 933 projects have been constructed: 350,000 cy in 1991 and 450,000 cy in 1997.

## ***PROPOSED NAVIGATION PROJECT MODIFICATIONS***

Initial plan formulation of modifications to the Wilmington Harbor Navigation Project has resulted in a recommended increase in the authorized channel depth for the ocean entrance channel from -40 ft to -44 ft, MLW. Actual depths constructed would exceed the authorized depth by 2 to 3 feet. Unfortunately, geotechnical studies have shown substantial quantities of rock to exist above elevation -40 MLW, within portions of the existing entrance channel alignment.

Subsequent Value Engineering analyses by the Wilmington District have recommended for the adoption of an alternate ocean entrance channel alignment for purposes of avoiding the substantial additive costs of rock removal. Similarly, portions of the outer channel extension were found to have seabeds which include hard corals. Accordingly, several alternate alignments are presently under consideration. As shown by Figure 2, the channel alignments under evaluation all turn easterly directly seaward of Bald Head Island. Several alternatives likewise include modifications westward of BHI in the vicinity of Jay Bird Shoals. The latter would result in a more shore perpendicular alignment of ebb tidal flow from the Cape Fear River in the vicinity of Bald Head Island.

As of January 1999, Wilmington District staff were evaluating issues regarding potential post-construction shoaling; navigability; environmental impacts and construction costs for each alternative channel alignment.

### ***CONSIDERATIONS TO BALD HEAD ISLAND***

Long term impacts of the existing navigation project channel alignment and authorized dimensions are expected to be occurring at Bald Head Island as a result of:

- a.) the elimination of natural pre-project sand bypassing phenomena associated with shoal migration at the mouth of the Cape Fear River;
- b.) the fixation of the navigation channel alignment at one location in extremely close proximity to the Bald Head Island shoreline;
- c.) continuous and long-term impacts to the sediment budget of the local sand sharing system extending from the Cape Fear Shoals to portions of Oak Island;
- d.) resultant significant long-term deflation of the ebb tidal shoals seaward of Bald Head Island;
- e.) the accentuation of the hydraulic gradients of flood tidal flows along the South Beach and West Beach shorelines of Bald Head Island and the increase in magnitude and frequency of occurrence of a major nearshore marginal flood tidal channel at the western extremity of South Beach, and
- f.) The directionality of ebb tidal flow directly toward West Beach resulting from the artificially maintained alignment of the Smith Island Range.

All of these phenomena exist today; and it is abundantly clear that most (if not all) of these phenomena will be exacerbated by the implementation of a channel realignment within the corridor under consideration (see Figure 2). It is therefore altogether reasonable to expect that the shoreline of Bald Head Island will react both adversely and concurrently with both initial construction of a channel re-alignment — as well as its continuing maintenance into the future at a new location within the existing, undisturbed portions of the ebb tidal shoal platform.

### ***PROPOSED MITIGATION BY FEDERAL INTERESTS***

For purposes of offsetting anticipated navigation project impacts associated with channel realignment and project deepening, three (3) mitigation elements should be implemented as part of *both* project construction and future project maintenance. The work should be performed integrally with the federal navigation project at 100% federal cost. The mitigation elements are as follows:

- a.) *Beach Fill* - At a *minimum*, some 2-3 Mcy of beach quality sand should be placed along the South Beach shoreline on Bald Head Island as advance fill. The fill should address the entire 16,000 ft. of shoreline and should be placed in accordance with a rational design based upon both existing and anticipated future littoral transport trends. Depending upon the condition of the shoreline at the time of project construction and the channel alignment selected by the Wilmington District, additional limited advance filling of West Beach should likewise be performed as a mitigation measure.
- b.) *Fill Maintenance* - Continuing maintenance of both the South Beach and West Beach shorelines should be performed utilizing beach quality sand excavated during annual channel maintenance. The *minimum* initial equivalent annualized requirement is presently estimated at 350,000 cy/yr. An updated maintenance requirement should be continually computed in the future based upon the best available data. The stipulated volume should be updated annually based upon a comprehensive monitoring program of both affected shorelines on Bald Head Island. All fill should be placed in such a manner that it results in the greatest spatial and temporal benefit to the affected shorelines, both developed and undeveloped.
- c.) *Nearshore Disposal* - Should beach quality sand in excess of initial or annual fill requirements become available, preference should be given to additional beach width enhancement. Should annualized beach filling be restricted due to permitting conditions, or other extenuating circumstances, nearshore disposal of "excess" material below the MLWL should be considered in the immediate vicinity of Bald Head Island. All such material placement should be strategically performed *only* in the more dynamic portions of the nearshore zone where direct benefit to the active littoral system can be assured via onshore transport by natural forces.

- d.) *Damages* - In the event that mitigation via item "a" through "c" above prove insufficient to offset project related impacts to Bald Head Island, the District must commit to the construction of additional structural or non-structural alternatives. Such mitigation must be provided at no expense to local interests, although the consent of local interests must be obtained in the selection of a preferred alternative.

Just as various federal agencies have determined that rock removal during project construction is uneconomical and that associated resource impacts are environmentally unacceptable, the Village of Bald Head Island feels similarly compelled to be adequately considered in the issue of ongoing and future erosional impacts due to navigation channel modifications. As a stakeholder in the process of "resource" impact evaluation, the Village believes that partnering with the District is possible, assuming that an adequate comprehensive Mitigation Plan between the two parties is reached. To that end, the Village is of the opinion that existing North Carolina Statutory requirements, as well as the necessity to be consistent with the State's Coastal Zone Management Plan, provide ample justification for the implementation of the mitigation elements discussed herein.

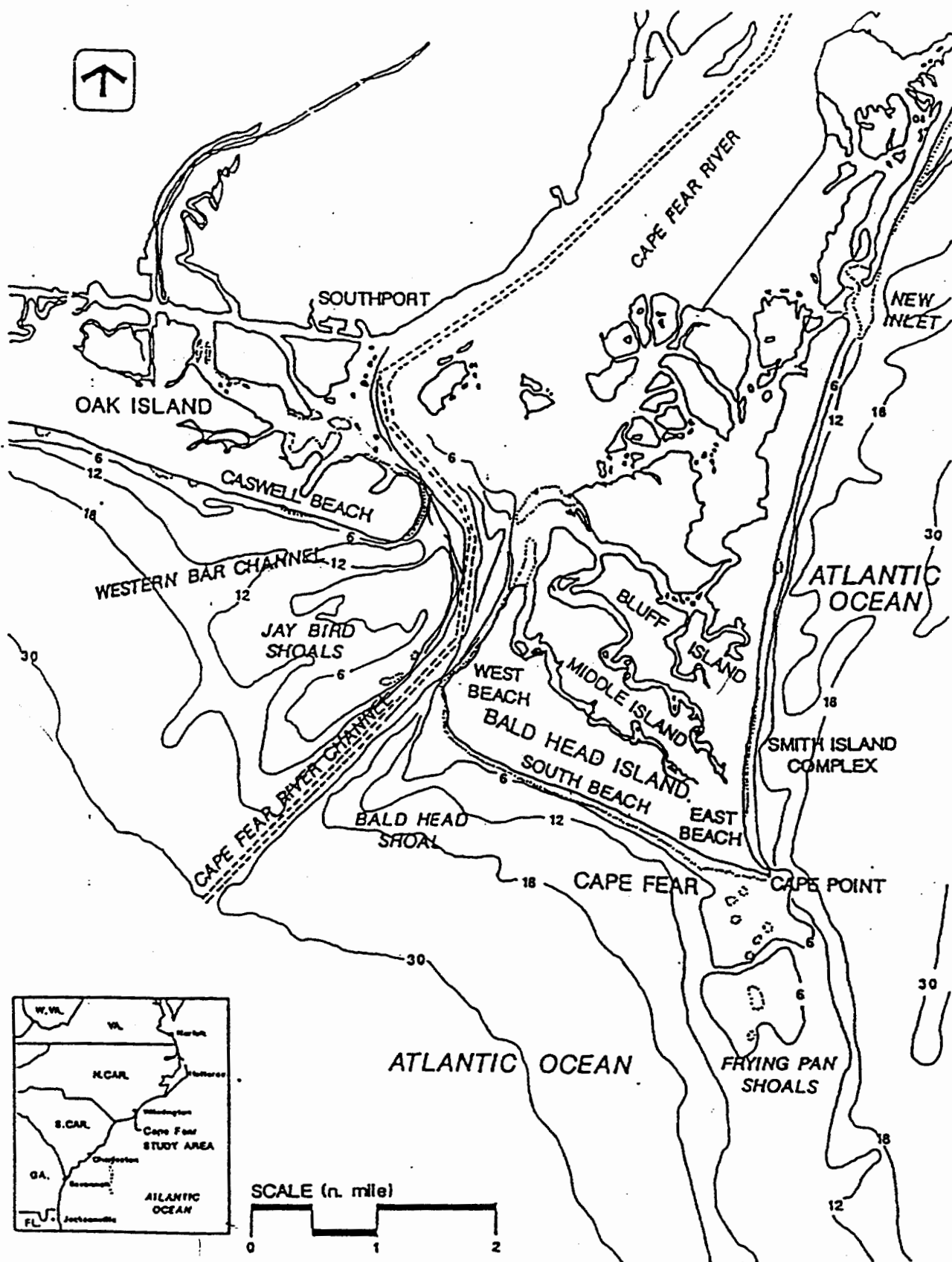
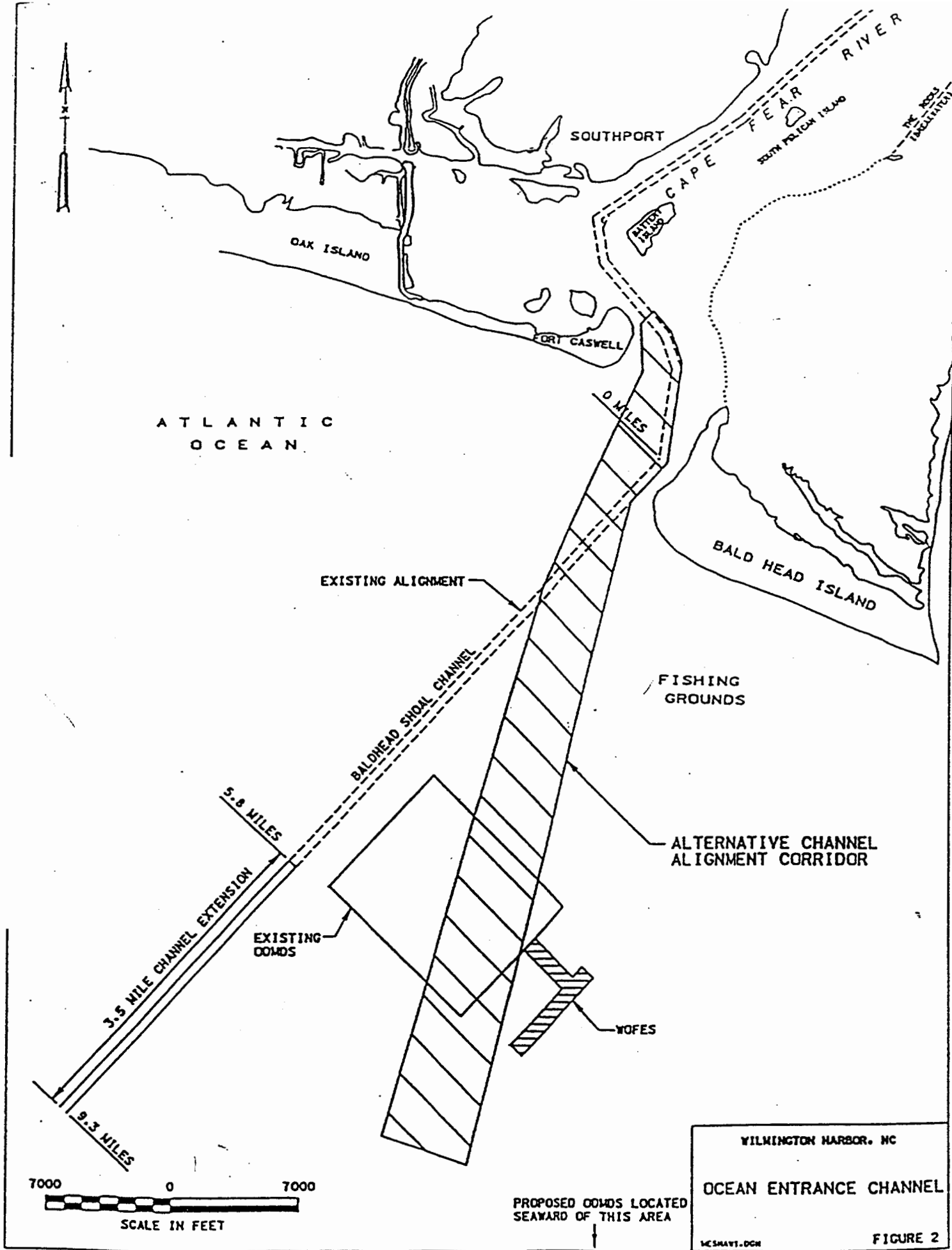
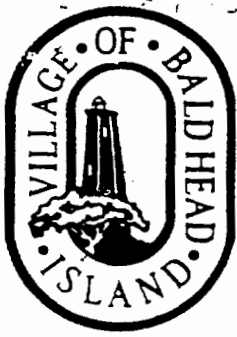


FIGURE 1 Vicinity map of Bald Head Island, North Carolina, USA.







# The Village of Bald Head Island

August 23, 1999

Michael F. Easley  
Attorney General  
State of North Carolina  
c/o Beth Yerxa  
Box 629  
Raleigh, NC 27602-0629

RE: Wilmington Harbor Project/  
Village of Bald Head Island

Dear Mike:

As Mayor of the Village of Bald Head Island, I am hereby, on behalf of the Village Council, requesting of you the following information and/or opinions in your capacity as the Attorney General for the State of North Carolina. Your response to these inquiries will be very much appreciated.

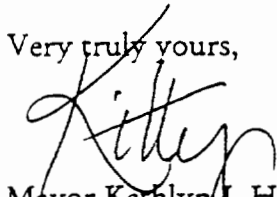
1. It is the understanding of the Village of Bald Head that the Wilmington Harbor Project now is intended to result in a new channel being dug near Bald Head Island, to replace the existing channel. The following questions relate specifically to that portion of the proposed project:
  - A. Does the channel realignment portion of the Wilmington Harbor Project require a consistency determination by the State of North Carolina under the Coastal Zone Management Act?
  - B. If the answer to the previous question is yes, has a consistency request been made to the State of North Carolina for that portion of the project?
  - C. If the answer to the above two questions are both yes, has there been a consistency determination made by the State of North Carolina, and if so, what was that determination?

Michael F. Easley  
August 23, 1999  
Page 2

- D. If a determination of consistency has been found by the State of North Carolina, upon request and application of the project sponsor, does the sponsor, in its request, commit to comply with North Carolina General Statute 113-229(H1), which states that *"all construction and maintenance dredgings of beach quality sand may be placed on the down drift beaches or, if placed elsewhere, an equivalent quality and quantity of sand from another location shall be placed on the down drift beaches."*
2. Have the impacts of the proposed channel relocation been addressed under the National Environmental Policy Act or the State Environmental Policy Act? If the answer is no, is it your opinion that such an analysis is required?
3. Please provide copies of all information in your files, or available to you, upon which the answers to these questions are based. Specifically, without limitation, please provide copies of any requests for a consistency determination as to the channel relocation portion of the harbor project, any responses given by the State of North Carolina to any such request, and copies of any environmental assessments or other environmental analyses which have been prepared and/or provided to the State of North Carolina relevant to this portion of the project.

Your cooperation and timely response will be very much appreciated.

Very truly yours,



Mayor Kathlyn J. Henson  
Village of Bald Head Island

KMK/KJH/lr

F:\LORIT\VILLAGE\MEASLEY.WPD



## State of North Carolina

Department of Justice

P. O. BOX 629

RALEIGH

27602-0629

MICHAEL F. EASLEY  
ATTORNEY GENERALReply to: Robin W. Smith  
Environmental Division  
Tel: (919) 716-6600  
Fax: (919) 716-6767

August 31, 1999

The Honorable Kathlyn J. Henson  
Post Office Box 3009  
Bald Head Island, N.C. 28461

Re: Wilmington Harbor Project

Dear Mayor Henson:

The Attorney General asked me, as counsel to the Coastal Resources Commission, to respond to your letter of August 23, 1999 concerning the Wilmington Harbor dredging project. It is the responsibility of the federal project agency, in this case the United States Army Corps of Engineers, to determine whether a proposed project in North Carolina's coastal area is consistent with the State's coastal management program. The Corps submits its consistency determination to the State for review and the State then has an opportunity to either concur or object.

The Wilmington Harbor maintenance dredging has been the subject of earlier consistency reviews by the State, but the Division of Coastal Management (DCM) has already notified the Corps that the proposed channel relocation will require a new consistency determination. The Corps has not yet submitted a consistency determination for review, so the State has taken no position on the project. In reviewing other modifications to the Wilmington Harbor dredging project in the past ten years, however, DCM has conditioned consistency concurrence on disposal of beach quality sand on the beaches. Consistency files on the Wilmington Harbor dredging are located in DCM's Raleigh office and you can contact consistency coordinator Steve Benton at (919) 733-2293 to arrange to review those files.

The Corps has conducted two scoping reviews under the National Environmental Policy Act (NEPA) on the new channel relocation project. The first was dated 01/28/99 and circulated to state review agencies by the State Clearing House under number 99-0441. The second was dated 6/22/99 and circulated under the number 99-0812. Copies of comments submitted by the state review agencies can be obtained from the State Clearing House in the Department of Administration.

August 31, 1999  
Page 2

Please call if I can be of further assistance.

Very truly yours,

A handwritten signature in black ink, appearing to read "R. Smith", with a long horizontal flourish extending to the right.

Robin W. Smith  
Special Deputy Attorney General

cc: Steve Benton  
Beth Yerxa



NORTH CAROLINA DEPARTMENT OF  
ENVIRONMENT AND NATURAL RESOURCES

DIVISION OF WATER RESOURCES

January 19, 2000

JAMES B. HUNT JR.  
GOVERNOR

BILL HOLMAN  
SECRETARY

JOHN N. MORRIS  
DIRECTOR

Mr. Harry Simmons, Chairman  
Brunswick Beaches Consortium  
707 Caswell Beach Road  
Caswell Beach, North Carolina 28465

Dear Mr. Simmons:

I met recently with the Corps of Engineers to review planning for the Wilmington Harbor deepening project. In order to reduce the frequency of maintenance dredging, the Corps is recommending widening the channel in certain areas. Some additional beach-quality sand is available in this part of the channel. These channel wideners will help to assure that the project will only need maintenance dredging every two years and thereby considerably reduce the cost of continuing maintenance.

This additional channel work is estimated to produce about 800,000 cubic yards of material suitable for beach use. Because these channel wideners are related to advance maintenance of the channel, and after discussion with the Corps, I believe that it would be appropriate to divide this material as recommended previously by the Corps for maintenance dredging material. This means that two-thirds of the additional 800,000 cubic yards would be deposited on the Bald Head Island side of the channel and one-third on the Caswell Beach-Oak Island side of the channel.

The existing plans for the Section 933 project will not be affected by this change.

We appreciate the opportunity to work with the Brunswick Beaches Consortium toward beneficial use of sand from the navigation channel. We will look forward to working with you toward the successful funding and construction of the project, including the high-priority restoration of Brunswick County beaches.

Sincerely,

*John N. Morris*  
John N. Morris

JNM/d

cc: Colonel James DeLony



MAILING ADDRESS: 1911 MAIL SERVICE CENTER, RALEIGH, NC 27609-1611  
PHYSICAL ADDRESS: 512 N. CALLEBURY STREET, RALEIGH, NC 27604  
PHONE 919-733-4084 FAX 919-733-3636

AN EQUAL OPPORTUNITY / AFFIRMATIVE ACTION EMPLOYER - 50% RECYCLED/10% POST-CONSUMER PAPER